

THE
AMERICAN JOURNAL OF PHARMACY.

MAY, 1854.

REMARKS ON THE PREPARATION OF HEAVY CALCINED
MAGNESIA.

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(An Inaugural Essay presented to the Philadelphia College of Pharmacy,
March, 1854.)

With a view to discover if possible the best practicable method of preparing [heavy] calcined magnesia, of fine quality for use in medicine, I have made numerous experiments. They are embodied in a condensed form in the following essay.

In order to make this paper as complete as possible, I have also made quantitative analyses of three of the most popular commercial varieties of magnesia in use, and a like analysis of one of the products prepared by myself. By a comparison of the analyses, and the samples submitted, an estimate may be formed of the availability of the process.

The great desiderata to be attained in magnesia, according to the opinion of most pharmacutists and physicians, are, purity, density, and smoothness or softness to the touch, qualities which are possessed in an éminent degree, by Henry's, Husband's, and Ellis' magnesias. The processes by which these are attained, have long been the subject of speculation among chemists and pharmacutists, and partly led to the examination of the subject detailed in this paper. The processes I have employed are of four kinds, viz.:

1st. The precipitation of sulphate of magnesia by carbonated and caustic alkalies.

2d. The decomposition of the chloride of magnesium by heat.

3d. The precipitation of the chloride by carbonated and caustic alkalies.

4th. The calcination of the regular mono-carbonate of magnesia.

1st. (a.) Boiling concentrated solutions of sulphate of magnesia and carbonate of soda, were mixed, and the whole evaporated almost to dryness. More water was then added, the temperature

raised to the boiling point, transferred to a filter, and the precipitate well washed.

After drying the precipitated carbonate and calcining it at a high heat, I found the product to be free from carbonic acid, about twice the specific gravity of the ordinary magnesia of the shops, not purely white, owing to the presence of iron, and possessed of a good degree of the softness so characteristic of a fine article.

(b.) A hot concentrated solution of sulphate of magnesia was mixed with a strong solution of sesqui-carbonate of ammonia, and the precipitated carbonate treated as in the first experiment. (a.)

The product was not so heavy nor so smooth as the foregoing, and like that was discolored by iron.

(c.) A solution of Epsom salts, similar to the one above described, was treated with the officinal liquor potassæ and boiled for ten minutes, when a very dense precipitate of hydrated magnesia was the result. After being washed, which required a long time to free it from sulphate of potassa, it was dried at a moderate heat, during which it assumed a granular consistence and became hard and gritty. At a full red heat this hydrate was not decomposed and could not be rendered fine and smooth.

(d.) Hot saturated solutions of the sulphate of magnesia and carbonate of soda were mixed as in the first experiment (a), and evaporated to complete dryness, stirring frequently. Water was now added, it was raised to the boiling point and the precipitate separated on a filter and washed well with hot water. The precipitate, after being dried at a moderate temperature, was calcined at a high red heat, which was continued about two hours. A dense though somewhat harsh magnesia was obtained, not, however, entirely free from carbonic acid and oxide of iron. In order to free it from these impurities it was washed with water acidulated with a few drops of pure muriatic acid. The acid decomposed the traces of carbonates present, forming with them and the iron soluble chlorides, which were dissolved out by the water, any trace of chlorine remaining being driven off by the subsequent heating to which the magnesia was exposed. This treatment rendered the product whiter, softer and more dense, and freed it entirely from carbonic acid.

(e.) Strong solutions of sulphate of magnesia and caustic soda were mixed and treated in the same manner as (d.) On attempt-

ing to dry the precipitate it fell into granules, very hard and gritty, which could not be reduced even by long trituration to a fine condition.

(f.) Having experienced much difficulty in the experiments with Epsom salts, on account of the iron which it contained contaminating the products of its decomposition, I tried in the last process, (e), to free it from that impurity by the following method. I first made a boiling hot solution of sulphate of magnesia, to which was added a sufficient quantity of carbonate of soda to form a small amount of carbonate of magnesia, expecting that the iron would go down with the precipitate and thus be separated, which, however, was but partially the case.

Second Series of Experiments.

Being dissatisfied with the results obtained from the foregoing experiments, I determined to try the feasibility of producing a magnesia of good quality by the decomposition of chloride of magnesium by heat. The following quantities I found convenient to operate upon:

Take of Hydrochloric acid, (of commerce,) two pints.

Nitric acid, a fluid ounce.

Water, half a pint.

Carbonate of magnesia, a sufficient quantity.

Mix the hydrochloric acid and water together and saturate the dilute acid thus formed with the carbonate of magnesia. Put the solution in a capsule of porcelain over a slow fire, and when it approaches the boiling point add the nitric acid, and boil the whole for ten minutes. An excess of carbonate of magnesia in powder is then to be added to completely neutralize the nitric acid. The solution is to be boiled a few minutes longer and then filtered. After filtering return the liquid to the vessel and evaporate with a gentle heat to complete dryness. When the evaporation is completed remove the mass from the capsule, and having reduced it to small fragments, place them in a Hessian crucible well glazed inside. Expose the crucible with its contents to a moderate heat, which gradually increase to a dull red. Continue the application of the heat for three hours or until the decomposition is complete.

This process, which was repeated several times, and varied in some of its details, furnished the specimens herewith presented

marked No. 6, 7, and 8. The former of these, as mentioned hereafter, is the best product I have succeeded in preparing, and is offered as approaching in fineness, softness and specific gravity, to the best article of heavy calcined magnesia manufactured.

Third Series of Experiments.

(a.) Precipitated a solution of chloride of magnesium with caustic soda. The precipitate while wet and in the recent condition, was very soft and beautiful; but on drying, it assumed the granulated and rough appearance spoken of in another place as pertaining to the hydrate.

(b.) Strong solutions of chloride of magnesium and carbonate of soda were mixed together. The precipitated carbonate was well washed, and after being partially dried, was introduced into a crucible, and calcined till free from carbonic acid. The produce was of a fine white color, and entirely free from harshness. The density of this article, however, was but little more than that of the ordinary commercial variety.

Wishing to ascertain the effect of water on magnesia, in modifying its density and smoothness, I passed steam into a bottle containing the result of the above process until about ten per cent. was absorbed. This rendered it much more dense; but impaired in some degree its original softness.

Fourth Experiment.

It having been suggested to me by a friend, that perhaps a good quality of magnesia could be made by calcining the regular monocarbonate of magnesia (often, though improperly called the bicarbonate) I determined to try the experiment, and proceeded in the following manner: Dissolved the carbonate of magnesia of the shops (which is a subcarbonate) in an aqueous solution of carbonic acid HO, CO_2 . Exposed the solution in a shallow vessel for a few days, that the excess of CO_2 might escape, when the salt was deposited in small crystals. These were dried and calcined, yielding a very inferior article, which was very light, adhering and caking under a slight pressure, and requiring long calcination to free it entirely from carbonic acid.

Remarks.

I propose offering a few remarks on some of the foregoing pro-

cesses and products, which may aid others who feel disposed to investigate the subject. A pure, heavy and smooth magnesia may be obtained either by precipitating a hot concentrated solution of sulphate of magnesia with a like solution of carbonate of soda, or by the decomposition of chloride of magnesium by heat.

It is difficult to say which of these processes is on the whole preferable. The difficulty of separating iron from the commercial sulphate of magnesia is an objection to the first process, but the heat in this need not be so carefully regulated as in operating upon the chloride. It has also the advantage of giving off no corrosive gas in the process of calcination. The precautions to be used in executing the formula before given, in which the chloride is prepared from commercial muriatic acid and carbonate of magnesia, and afterwards decomposed by heat, pertain mainly to the separation of iron and the regulation of the heat.

As commercial muriatic acid always contains more or less iron, it is important to find the best and cheapest method of freeing it from that impurity without resorting to the process of redistillation.

The nitric acid, which in the formula is directed to be added to the solution of chloride of magnesium, answers the purpose admirably. The acid acts by peroxidizing the iron, which is almost entirely precipitated and separated by neutralizing the nitric acid with an excess of carbonate of magnesia, and then filtering the solution, during which it will often be necessary to add a little water to prevent its congealing. During the evaporation, the fire must be under the complete control of the operator, or the vessel of such capacity as to hold considerably more than he is operating upon, for without this precaution the solution, as it becomes concentrated, will froth up so as to be spirted out of the capsule.

Towards the close of the evaporation, and as the chloride becomes more and more decomposed, it sinks to the bottom of the capsule in the form of a hard cake of subchloride, from which, as the decomposition proceeds, the chlorine escapes through minute holes, which give the mass somewhat the appearance of a honey comb.

In regard to the intensity and duration of the heat in the calcination, I have come to the conclusion, after many trials, that a low heat, just approaching to redness and long continued, will en-

sure a much finer product, than the sudden application of a high heat for a short time.

The above fact will appear much clearer on an examination of one of the specimens presented—No. 9. This sample bid fair at the beginning of the process to be of superior quality, but the crucible containing the subchloride was placed in a strong air furnace and raised quickly to a white heat, which was continued three hours. After the fire had cooled down, the contents of the crucible was removed, and very much to my surprise and disappointment, found to be in a hard semifused mass of a cellular form, and colored with iron derived from the crucible.

It is a difficult matter to procure crucibles that combine all the requisite qualities, viz., cheapness, durability, and freedom from iron or other substances easily acted on by the chlorine. I found the white Hessian crucibles, when well glazed inside, to be superior to any other kind that I could procure. I employed a small crucible of the above description in eight operations before it became useless. Berlin-ware crucibles would be the best to use, were it not for their expensiveness and liability to fracture on the sudden application or withdrawal of heat.

The specimen marked No. 7 is part of a lot that was kept at as high a heat as a German porcelain evaporating dish would bear, for eight hours, when it was found to be in a granular powder, almost free from chlorine. This powder was removed to a filter, and washed well with hot water, dried, and again exposed to heat for a short time. This treatment rendered it somewhat finer, but the crystalline condition could not be entirely overcome, even by long trituration.

The above sample is the one analyzed, and contains over 95 per cent. of pure magnesia. No. 8 is a portion of the same specimen which has not been trituated, and shows very clearly the granular condition just mentioned in connection with No. 7.

Specimen No. 6 exceeds so much in fineness and density the others, that the question naturally arises, what is the cause of so great a difference in these three samples made by the same process. In one case the crystalline character is almost entirely broken up, while in the others the very opposite results were produced. I must confess my inability to offer a satisfactory solution

of the question, but leave it with the hope that abler hands than mine will give an answer.

The fused subchloride, when freshly broken, presents a beautiful striated fracture. A dilute solution of the chloride allowed to evaporate spontaneously on a plate of glass, deposited crystals, which, in their mode of formation and general appearance, resembled those of nitrate of ammonia. They were, however, very deliquescent, and could not therefore be long preserved.

A specimen (No. 10) of hydrate of magnesia in mass, contaminated with iron, is presented with the other specimens. The results of the analyses previously referred to, of different ponderous magnesias of commerce, are here presented in tabular form. They have been made with care and attention to accuracy.

	Henry's, Sp. gr. 3.404.	Husband's, Sp. gr. 3.386.	Ellis's, Sp. gr. 3.386.	T. H. Barr's Specimen, No. 7. Sp. gr. 3.442.
Magnesia, . . .	94.40	84.306	94.04	95.016
Water, . . . .	.50	11.400	.80	1.300
Silica, . . . .	.80	Trace	Trace	Trace
Iron,	1.20	.700	.80	.400
Lime, . . . . .	.11	1.008	1.81	.404
Alumina, . . .	1.80	.500	.60	1.200
Sulph. Magnes. .	.30	.300	.50	.800
Sulph. Soda, . .	1 60	1.100	.70	.400
Chlorine, . . .			Trace.	Trace.
	100.71	99 314	99.25	99.520

There is one point in particular in the analyses to which I would like to call attention, and that is the large proportion of silica in Henry's magnesia compared with that contained in the others. The greater part of the silica in the article referred to, was left behind as a gelatinous precipitate with a little anhydrous silica. A precipitate of this kind is produced only when a silicate of some base is decomposed. It is supposed, and I think with reason, that Henry's magnesia is calcined at a very high temperature, and as magnesia will unite with silicic acid (which is contained in, almost if not all, crucibles) at a high heat, I think that this will account for the presence of that impurity in such a large proportion. The amount of silica contained in the others is a mere trace.

The amount of water found by me in Henry's and Ellis's magnesias approximates closely with that found by Prof. Procter, (see *Am. Journal of Pharmacy*, Vol. 22, page 383,) but with Husband's there is a considerable difference in the results, showing

that different specimens differ in the amount of water which they contain.

The true hydrate of magnesia contains about thirty per cent. of water, and, as I have shown in this essay, is gritty, and not a desirable article, from which it would seem that Husband's, like the ordinary English calcined, is only partially hydrated, probably by the gradual absorption of water after leaving the fire. This is rendered more probable from the known fact that caustic magnesia has a much stronger affinity for water than for carbonic acid. My attempt to improve the physical properties of a specimen by passing steam into it failed, and I have found, moreover, that Husband's magnesia is softer after being dehydrated than before, so that whatever effect water may have upon the therapeutic action of this medicine, I do not believe it is calculated to improve its softness or impalpability.

The subject of this paper has occupied as much time and attention as I can now devote to it; but I am convinced that the whole question is still worthy of careful investigation, with a view to ascertain not only the cheapest and most productive process, but also which of the products obtained are most worthy the esteem of the medical practitioner.

If, in the course of these experiments, I have elicited any new facts connected with this often mooted subject, of interest or advantage to the profession of Pharmacy, my labor will not have been in vain.

It is proper for me to state in this place, that the experiments detailed in this paper were made in the laboratory of my preceptor, Mr. Edward Parrish, and I acknowledge my obligations to him for the opportunities afforded me for prosecuting my investigations.

NOTE.—[We have examined the three specimens of magnesia, referred to at page 196, as regards their texture and appearance, in comparison with Henry's magnesia. Specimen No. 6 agrees very closely with the best heavy magnesias of commerce, yet it lacks, in a readily appreciable degree, the velvety softness of genuine Henry's or Husband's magnesia, or that of the Messrs. Ellis. As a first result it is very successful, and speaks well for the skill of Mr. Barr.—EDITOR.]

ADDRESS DELIVERED TO THE GRADUATES OF THE COLLEGE OF PHARMACY OF THE CITY OF NEW YORK, BY THE PRESIDENT, MR. GEORGE D. COGGESHALL, AT THE STATED MEETING, MARCH 16, 1854.

At the close of his address, on motion, the President was requested to furnish the Secretary with copies, to be offered for publication in the New York and in the American Journals of Pharmacy.

By order,

F. A. HEGEMAN, Secretary.

GENTLEMEN GRADUATES OF THIS COLLEGE,—

It is a pleasure to congratulate you upon the successful issue of your term of study, and we have invited you to meet with us this evening, that we may present you with the Diploma according to prescribed form. Your connexion with the College as students closes with this ceremony, and the full responsibility of accredited professional standing from this time devolves upon you. We trust that this Diploma will be so regarded by you, and that it may never suffer reproach through neglect or dereliction from duty on your part.

It is an appropriate custom, on occasions like the present, to unite with our congratulations on past success some considerations upon the duties of future professional life. And it is not only an appropriate, but a wholesome custom; for such is the relaxing influence of habit upon the mind, that it is good for us all, at successive points of our progress, to improve occasions which most naturally arrest our serious attention, and claim an earnest reconsideration of our duties in the community. Surely this, if rightly estimated, is to us a proper time for reflection, when we are giving our official sanction to practice as Pharmacutists to young men whose relation to us as students is thus closed, whose praiseworthy application to the early study of their profession gives fair promise, as we hope, of honorable distinction in the future practice of it.

The business of an Apothecary, which you are hereafter to pursue, is of a two-fold character. It is not only that of a shop-keeper, in the ordinary sense, and in which you are bound by the ordinary rules of fair dealing with your customers; it comprises also the cares, the duties, the full accountability and the prerogatives of a most important profession. "To buy and sell and get

gain," to practice your art for emolument, is certainly and justly the ultimate object of your pursuit ; let it not be, as it too often is, the first and only controlling object. Far higher considerations of duty are incumbent upon you than upon a mere tradesman. You are to assume the great trust of preparing medicines for the sick, upon which are placed their hopes of arresting disease, of restoring health, of saving life itself, or at least of alleviating so much as human remedies can, hopeless fatal suffering. If it be true that "all that a man hath will he give for his life," so far as the safety of any one of your fellow men may be entrusted to your care, it must be held sacred, first of all considerations for the time, in the discharge of your professional duties ; if emolument ensue it is well, and honestly earned ; but first of all, and paramount to all the mercenary impulses of trade, should be your duty, your professional honor. Your calling is an arduous and comparatively ill-requited one. It demands continuous study, if you would keep up with the constantly accelerating progress of science, constant watchfulness against frauds and adulterations in drugs, careful examination of the qualities of those you select for dispensing, and against their having suffered depreciation at the time you use them, that your combinations are accurately made with accurate weights and measures. In all these particulars you must be vigilant and faithful. The immediate responsibility of the medicines required by the sick rests upon you as the dependence of last resort, upon whose skill and integrity all hopes of restoration may be placed, and from whose incapacity, unfaithfulness, or error, there often may be no appeal ; it may be too late for a "correction of errors." Far removed from the sick chamber are the counting house of the importer and the warehouse of the wholesale dealer, where medicines are merchandize, the Price Current outweighs the Dispensatory ; and the anxious fear, the trembling hope with which the ultimate destination of their "goods" may be watched by sleepless eyes and aching hearts, are matters too remote to interrupt the current of trade ; yet these are the commercial sources whence you derive the crude materials upon which your art is to be employed for the immediate use of the sick. The direct responsibility, therefore, rests upon you, and neither in manner nor in part can you evade or transfer it.

Amongst the prominent objects of interest continually pre-

sented to you, continually forced upon your attention as practitioners of pharmacy, is one that is at once the reproach of medicine and the bane of society—Quackery. It is ever present and ever ready with its temptations, in opposition to the common understanding of right minded men connected with the regular professions of medicine and pharmacy, that discoveries of any means calculated to alleviate human suffering should be made generally known, that all whose province it is to prepare or apply remedies, may have the knowledge requisite for their proper manipulation and use, be enabled to suggest improvements, and to combine or separate, so as to adapt them to particular cases; and that to keep secret any useful discovery in medicine for the selfish purpose of gain, is unworthy of, and below the honorable standard of character, that every physician and pharmacist should scrupulously maintain; while the tampering with medicines by ignorant persons, and the manufacture of worthless trash under its name, are grades of depravity with which no compromise should ever be made.

The monstrous growth of quackery in modern times has, at least, kept pace with the advancement of the age in arts and sciences, designed to benefit, or, when State policy requires, more expertly to destroy the human race. It protrudes itself with the most business-like assurance into all classes and circles of society; it is ever present at the corners of the streets and in our dwellings, mixes with our daily news, buying up the easily purchasable public press, which subsists in a great measure upon it, (the only honorable exception, so far as we know, being Arthur's Home Gazette, an excellent weekly published in Philadelphia,) and it promptly makes up all deficiency of fact with brazen falsehood. History, ancient and modern, is ransacked, or even made when it is needed; current events and discussions of general interest, political, social, moral and religious, all are used as material for introductory paragraphs to the most preposterous eulogies of quack medicines. Many of these literary productions are by a class of scribblers of prose and verse, (such as it is,) who, not esteemed in any other, and probably incapable of any better employment of their talents, hire themselves to write puffs of nostrums they know nothing about. Great names are dragged into base connexion with pills, mixtures, lotions, plasters, etc., to give them currency, and fictitious ones are often substituted, as more likely to be popu-

lar, or perhaps less objectionable, than those of the real actors and recipients of the profits. Names, too, of all countries and people are appropriated whenever they can be made available. "The poor Indian" and the self-inflated Chinese are made involuntary sponsors for things as little known to them, as their language or methods of treating disease are to the nostrum makers, from whom they receive such unexpected distinction. Frightful maladies, which are providentially of rare occurrence except in these advertisements, are multiplied to suit the market, detailed with revolting minuteness, and the text illustrated with literally horrible cuts. Certificates of cures that never occurred are signed by persons that cannot be found, though their story is "told with a circumstance" of street and number, and sworn to before the Mayor or some other prominent functionary, before whom, by the way, any thing may be sworn, as he never reads it, because it matters nothing to him, yet the appendage of his name helps to pluck the great public goose. In many cases, medicines in common use are dressed in some insignificant disguise, when "presto!" what had been only simple matter of fact, becomes astonishing, and worth a great deal more in cash, whereupon, it is put up in set form with printed envelopes, showing that to bring this great discovery to the point of projection, required besides a vast expenditure of money, the whole depth of knowledge, all the skill and, through many years, the self-sacrificing devotion of the wondrous genius that has finally brought it forth, "without whose signature none can be genuine," said signature being engraved or stereotyped. New remedial agents, discovered or developed by the researches of the best minds engaged in medical science, are at once seized upon by quacks as the bases of names for new nostrums, they, forsooth, covering with the slime of their "*Compound*" the most brilliant results of learning, which from inception to promulgation would have been as far beyond the reach of their intellect as above the level of their morals. With parasite meanness, they attach themselves to the productions of men whose names will be cherished with honor and gratitude when the whole pack of charlatans are

"Forgotten as fools, or remembered as worse."

As the wares of these men are got up to entice customers, every popular prejudice must be turned to account, the most petted being one that really exists to some extent, though greatly exag-

gerated, against minerals and in favor of vegetables. Accordingly we find this string especially harped upon, a large proportion of quack medicines being named and strenuously declared to be vegetable. There are favorite vegetables also, of which the popular estimate is duly encouraged, and of all these, Sarsaparilla may be considered the "best abused" root in the Pharmacopœia. Other popular notions are treated with respect in proportion to the demand they create, and from time to time new and marvellous theories are broached, as there appears to be vacancy in the public mind for their reception. It is propounded by the pill or purging school of quacks that there is but one disease, all that are called by different names being but different forms of it, for which "Universal Pills" are obviously the very remedy. The universal school, however, comprises more than this class, whose chief mission appears to be to open men's purses by opening their bowels. There are some who do not regard the pill machine as the only instrument of human relief, there being various lights in which the one disease may be considered, according to the nostrum that is made for it; with one it is heat, with another cold, with a third both. Again it is in the stomach, the skin, the nerves or the blood. Some "Universal Vegetable Renovators" (their very name is nonsense) are applied internally, others upon the surface, but each is declared to be the only medicine that should ever be bought, that no family is safe without it or with any other, that "all others are base and dangerous impositions," the work of ignorant rogues. This latter opinion appears to be cordially reciprocated by most of the fraternity, and is perhaps the nearest truth of any they express. Other quacks denounce the universal system as unprincipled quackery, and are quite positive that none but a simpleton or impostor ever denies the existence of many diseases; they therefore condense their wisdom upon certain specialities making stories however as entire, so far as they go, as any of universal pretensions. In short, the whole system, based as it is upon the ignorance, the fears and the credulity of mankind in reference to all matters affecting health and disease, is yet so monstrous, so impudent in falsehood, that it would be ludicrous if it were not so mischievous. If its continued presence from the dark ages had not rendered it familiar, if habit had not blunted our sense of its depravity, if it could now be presented in all its deformity before a civilized community for the first time, it

would be regarded with wonder at its audacity, with execration at its reckless tampering with the best temporal interests of humanity.

We hope better things of our graduates, (though we must confess we are sometimes disappointed,) than that they should degrade their profession and deprave themselves by such prostitution of their talents and position. It is pitch that you cannot touch without being defiled. Its temptations are often great it is true, its success in one sense, and one only, sometimes astonishing; yet it often, probably in a large majority of cases, fails to secure even pecuniary success, always unsatisfying at best when gained at the cost of honor, of self respect, and the respect of the intelligent part of society, perhaps coupled with some nickname of derision; (and poor indeed is he, who having staked all of principle and good repute upon such a cast, has not won even that.)

Gentlemen, in the honest and honorable pursuit of your profession, you will find with many cares and much tedious labor many sources of interest that will improve and elevate your minds, the frequent association with the learned and intelligent, the respect and confidence of those who require your professional services, and the unfailing reward of duty well done. Your path will not be one of roses altogether—do not hope for it. Act faithfully and honorably as you may, your best motives will be misconstrued, your best actions misrepresented, your best efforts underrated by the weak-minded and unworthy; but the respect and confidence of the better part of those who know you, will overbalance such annoyances; (and in proportion to the consciousness of doing right, is the comfort of self approval.) In the practice of your profession you will find scope enough for the exercise of all the cardinal virtues, if you have them, and need enough for the cultivation of those in which you may be deficient. You must not only be scrupulously honest in what you do, you must be equally conscientious in making sure that nothing is left undone which ought to be done. You are required to be careful, as much as you are to be honest in the dispensing of medicine. You have no right to indulge in absence of mind, when the safety of a fellow creature depends upon your undivided attention, and you may be roused from such abstraction by consequences of your criminal inadvertence alike frightful and irretrievable. Your profession demands from you constant unremitting devotion to duty, duty in little things which are unknown

save to yourself, and in this consists your true virtue. (It is easy enough to be great upon occasion, when public applause and silver plate are the showy rewards in prospect—men of base and selfish minds might even court opportunity for such display—but the true gold of a man's character is proved by his devotion to duty for the sake of duty, to the performance of duties unknown to others that are often tedious and burdensome, the full and faithful discharge of his duties, not because in so doing he is seen or praised or will ever be appreciated or rewarded, but from his own sense of right.)

In your practice as Pharmaceutists nothing can be wholly unimportant. Your course cannot be a matter of indifference to the community around you. If you are any thing in your profession, if you move at all in it, you must exert some influence, more or less, good or evil. Be ever watchful that it is good. Be great if you can, but be faithful whether or not, and if your name be not famous it will be honorable, if not spoken all over the earth, it will be a pleasant sound to your neighbors, reminding them of a trusty friend in seasons of anxiety and suffering, and synonymous in their estimation with all that designates the upright and useful man.

ON RICINIS COMMUNIS.

By HENRY BOWER.

(*An Inaugural Essay, presented to the Philadelphia College of Pharmacy, March, 1854.*)

The castor oil plant (*Ricinus communis*) belongs to the natural order Euphorbiaceæ, whose affinities have not yet been accurately limited by Botanists; but it is supposed to comprise 1500 species, distributed in each quarter of the globe, from the equator to latitudes as high as Great Britain. "Sometimes found," as Professor Lindley remarks, "in the form of large trees, frequently of bushes, still more usually of diminutive weeds, and occasionally of deformed, leafless, succulent plants, resembling the cacti in their port."

The properties of this order of plants are remarkably varied, not only as regards their physical effects, which range from gentle stimulants to rank poisons, but also in those principles residing in different portions of the plant. In the *Ricinus communis* they are

found in the fruit ; and the seeds of fifteen varieties of the order, that have been examined, all, excepting one, the *Omphalia triana* of St. Domingo, yielded virtues of an emeto-cathartic nature.

Some of these plants furnish properties highly valuable, on account of their medicinal uses, and first among them ranks the *Ricinus communis*, as it yields an oil that is used to an immense extent, not only in domestic practice, but is sanctioned by the medical profession as a most invaluable laxative and mild purgative.

The fleshy portion of the bean, in the analysis of Geiger, (which was the only one to be found,) is given as consisting principally of starch ; but all attempts to obtain a blue color with iodine failed. From this circumstance, and the fact of the beans forming an emulsion with cold water, it was inferred that they contained a peculiar albuminous principle analogous to that existing in almonds ; further experiment verified this. A product resembling emulsin was obtained by making an emulsion of the beans with water, adding to this twice its bulk of ether, and after frequent agitation allowing it to stand, when a transparent fluid separated at the bottom of the vessel ; this was separated from the supernatant ethereal mixture, and alcohol added, which threw down a precipitate white and flocculent ; this was collected upon a filter, and washed with fresh portions of alcohol, and dried under the receiver of an air-pump. This product was soluble in water, the solution reddening litmus paper, and when heated to 212° coagulated. But its most distinctive property was its producing the decomposition of amygdalin, yielding the odor of bitter almonds and hydrocyanic acid, but not in so marked a degree as the emulsin of almonds, although upon mixing the solutions, and allowing them to stand for a few days, the bitter almond odor was fully developed.

When an emulsion of the beans is made, a peculiar nauseous odor is given off, which, before the addition of the water, is not in the least perceptible in the bean ; this odor is more fully developed by maceration and distillation with water ; and with water rendered slightly alkaline by potassa, the uncondensed vapor had a most nauseating smell, producing absolute sickness of the stomach in an individual previously vomited by the seeds.

The emulsion becomes incapable of giving off this smell when

coagulated by heat, and with beans previously boiled in alcohol or dilute acids, no odor is perceptible in afterwards forming the emulsion with water, whilst ether appears to extract no principle, as, after digestion in it, they yield the odor alluded to by trituration with water.

Although, in the experiments, no volatile oil was obtained by distillation, owing possibly to the small quantity of the marc used, yet it is highly probable a principle does exist in the bean analogous to amygdalin or sulpho-sinapism, which, with water, undergoes the peculiar fermentation with the emulsin, forming a new substance of an odorous nature, as well as very acrid and poisonous.

That this acrid principle is not volatilized by heat alone, as has been for a long while the impression, was satisfactorily proven. As the cake residue, after expression, was thoroughly exhausted by ether, to free it from the oil, this was then heated for some length of time upon an iron plate, at a temperature sufficiently high to slightly roast it. Twenty grains of this taken by an individual produced the most violent emeto-cathartic effects, being vomited and purged for the space of seven or eight hours.

These experiments go far towards showing the importance of boiling the expressed oil with water, as the acrid principle being rendered volatile, is driven off, not by the mere application of heat alone, but from the fact of the presence of water in the operation.

But this process must be carefully employed, or the fat acids of the oil become materially modified, and are rendered acrid and rancid, as in that made in the West Indies, which is prepared without regard to the amount of heat used.

The chemical nature of these acids is not as yet fully understood, being still the subject of research by many eminent chemists in Europe.

Although all attempts were fruitless to isolate any decided principle of an acrid character, sufficient evidence was adduced to verify the assertion that principles do exist in the bean which are rendered both odorous and volatile by the intervention of water; and it is hoped, by future experiment upon this interesting subject, more definite results may be obtained.

ON THE ADULTERATION OF DRUGS AND CHEMICAL PREPARATIONS.

By J. M. MAISCH.

There have been frequent complaints, and much has been said and written about the adulteration of drugs, and of pharmaceutical and chemical preparations, and it is obvious enough that every druggist, whether wholesaler or retailer, cannot be too careful in closely examining the articles which he buys, not merely judging from their appearance, their color, &c., as to their purity, but in testing and analyzing them so far as scientific researches will allow. Science, for some of the crude drugs, has succeeded in finding a way to ascertain to a certainty the commercial value of them; for many others we are yet compelled to rely merely on the physical properties.

It is different with chemical preparations. Here, in most instances, an analysis can be made to become satisfied in regard to the purity of such chemicals, and it is in these cases where apothecaries ought not to rely on the competency and integrity of the manufacturer or wholesale dealer. There is a possibility of a mistake occurring in labelling or unintentionally mixing two different articles of close resemblance, and it becomes the duty of the prescriptionist to be satisfied as to their purity and standard composition. Testing to detect the most common adulterations will generally answer; an experienced hand will, in most cases, then get a hint, if some extraordinary impurity be present, and find means to ascertain its nature. For the analyzer it is a matter of obligation to his professional colleagues, to put them on their guard by publishing his results, and the surest and easiest way to detect such adulterations.

Last year there was introduced into the European markets an iodide of potassium, which was of neutral reaction, and contained a very small amount of the impurities common to this preparation, in fact, it presented the appearance of an unsuspecting, almost chemically pure article. A. Erdmann (*Archiv. der Pharm.*, lxxv., page 288) found that on dissolving it in as small a quantity of water as would dissolve a certain amount of iodide of potassium, it would leave behind fragments of crystals, which required from 13 to 14 parts of cold water to dissolve them; they were insoluble

in 80 per cent. alcohol, effervesced with acids, and proved to be *bicarbonate of soda*.

Precipitated carbonate of lime was lately purchased of a house in this city of great respectability and integrity. It is of a very fine white color, and its particles are of a minute division; it seems to be an excellent preparation, and no doubt might be used for any of the ordinary prescriptions without finding the least fault with it. But it is soluble in a large quantity of distilled water, and does not effervesce on addition of acids. On analyzing, it was found to be *sulphate of lime*. Half an ounce (troy) of it, after exposure to a red heat, left a residue weighing 3 dr. 11 grs., loss 49 grains, or 20·833 per cent., which figure accurately corresponds with the hydrated sulphate of lime of the formula $\text{Ca O, SO}_3 + 2\text{HO}$. The Dispensatory of the United States says, of the precipitated carbonate of lime: "It is said to be *occasionally adulterated* with sulphate of lime." Here we have a case where the same was entirely *substituted* for it. Whether this was done accidentally or intentionally I am unable to say; but it is due to the drug house of this city to state that they did not manufacture it, and doubtless sold it depending upon the respectability of the manufacturer.

If suggestions as made above, analyzing the purchased chemicals and crude drugs as far as possible, publishing the results, if adulterations were found, and giving the best mode ascertained of detecting them; if these suggestions were carried out faithfully, I have no doubt, in a short space of time, we would have a market of drugs, and particularly of chemical preparations, much purer and less adulterated than they are sometimes met with at the present time.

Philada., March, 1854.

AMERICAN PHARMACY.

By EDWARD PARRISH.

(Continued from page 118.)

Having in the last number directed attention to the principal duties and responsibilities of druggists and apothecaries, and the community of interests which grows out of them, and endeavored to illustrate the advantage of a unity of purpose and action, among those engaged in these responsible and important duties, it is

the design of the present article to advert to the present position of the trade, and to some of the objects, to which its energies might be turned with advantage, reserving for a future essay some hints toward the best means of effecting a thorough and effective organization.

The natural enemy to the profession of Pharmacy is the quack. Of all the species of this parasitic genus, (some species of which infest every profession,) the most characteristic and well defined is the manufacturer of secret medicines or nostrums; depending upon ignorance and credulity for support, the medicine quack is interested in suppressing the growth of intelligence among the masses of science and a high code of honor among apothecaries and druggists. His interest would be promoted by reducing every drug store to an agency for patent medicines or a store for general merchandizing, and every Pharmaceutist to a mere salesman and shopkeeper. He would have the public draw their ideas of medical practice from the newspapers, which he has bribed into the propagation of his favorite ideas. His profound philosophy has succeeded in so simplifying this complex human organism, that all the mysteries of pathology and therapeutics vanish before his magic compound. There is no need of a *materia medica* beyond the ingredients which it contains. No need of a physician to direct or an apothecary to prepare a medicine for the diseases, which his charm can so soon dispel. This philosophy he preaches, with the zeal of a propagandist through the many-tongued newspaper press, and editors whose office is to cultivate the public mind, and to sow therein the seeds of knowledge and virtue, are, with some honorable exceptions, waked by the potent agencies behind the scenes, into strains of high encomium and unmerited praise.

What wonder then, that as a profession, dependent upon public patronage for support, we are completely prostrate; that we scarcely can, if we would, act a manly and independent part. The druggist must make a living; this is the great motive power in his, as in every other business, and in many instances, his bread and butter would fail, if eschewing all quackery he should hold up, by example and precept, a dignified testimony to his honest convictions. It is true that he may keep a tolerably clear conscience, as men can in almost any pursuit, by a sort of com-

promise between interest and duty. He may neutralize his actions with Q. S. of words, but the compound formed proves a feeble antidote to quackery, and certainly can not be labelled consistency.

That this is the position of the great majority of druggists, in regard to quackery, is well known; I believe it is mainly the result of our past neglect to avail ourselves of the advantages within our reach, and may be entirely obviated, and the profession of pharmacy raised to its true dignity and importance by uniform and well directed efforts in the future.

Druggists everywhere enjoy the most intimate relationship with the public. Acquainted by study and long familiarity with those potent agents provided by nature for the relief of pain and cure of disease, they share with the physician a peculiar and distinguished place in the confidence of those with whom they come in contact, in the line of their business. They may, to a great extent, give direction to the current of popular favor, and if possessed of the requisite knowledge and capacity to ascertain the constituents of the various nostrums they are called upon to supply, they may not only strip these of their false pretensions, but from the resources of the pharmaceutic art, may supply equally valuable standard remedies. It is, indeed, one of the duties our profession owes to the public, to supply every legitimate want, without even the apparent necessity of a recourse to the productions of the empiric.

The relations of the druggist with the physician, if properly maintained, would be found to give him an immense advantage in his warfare with quackery; so long as he pursues his calling with a just regard to the rights and interests of the medical profession and the public, and lends the weight of his influence against the common enemy, he will have the active support of all wise and liberal physicians. In strengthening the hands of these, he will be rearing for himself the strongest defence against the destructive competition of the unprincipled quack.

The intelligent and honest pharmacist, in the pursuit of his legitimate business, will always enjoy the esteem of the community, while the quack is held in disrepute by a large class of the wiser and more conservative people; success even in imposture, may draw with it the plaudits of the fickle crowd, who regard money

as a fit substitute for honest merit, but to those thinking and knowing men, whose opinions give direction to the under current of public sentiment, the thrift which follows industry combined with high and honorable principle, is a more certain passport to an honorable position, than all the wealth that can be acquired by the charlatan or quack.

Let us then, with a hopeful reliance upon the strength of our cause, labor to rescue our honorable and useful profession from the embrace which has so long choked out its vitality, and cast reproach upon its character, and in good earnest seek to infuse into it a vigorous and manly spirit, which shall result in its independence, its growth and improvement.

To this end, our first great movement must be to organize. This step, we may indulge the hope, will soon lead on to every needful reform, frequent comparison of sentiment will gradually induce a more uniform practice throughout the country, often recurring social intercourse will awaken interest in each other, and a bond of union will be developed, co-extensive with the organization; besides these social and ethical advantages, the scientific and business character which will be imparted to our intercourse, will tend to the common advantage, ideas which are capable of being individually profitable and advantageous, will become common property, the asperities of competition will be worn off, and an enlarged and liberal spirit begin to be realized, which will scorn unworthy tricks of trade, and seek the welfare of the profession at large, as well as the more selfish pursuit of individual advancement.

Without considering in detail the reforms which may prospectively grow out of an extended and thorough organization, among which the suppression of quackery stands conspicuous, it may be well to refer to some of the objects most immediately claiming the attention of those comprising the existing organizations; prominent among these is the education of the next generation of apothecaries. This object is of paramount importance in connection with the advancement of the profession and the suppression of quackery. Although a scientific education is not indispensable to success, nor even to eminence, yet it is undoubtedly an immense advantage, and experience proves that those who avail themselves of it, are generally better apotheca-

ries than those who do not. The position of the writer, enables him to come to this judgment intelligently. As an agent of the College of Pharmacy in procuring situations for its graduates and others, he has become aware of the immense advantage of its diploma to those who possess it; as a general rule it is a sufficient passport to any station in the business, which may be vacant, so that, although a diploma is perhaps sometimes overrated, yet no young man who expects to devote himself to the drug, and especially the apothecary business, should think of dispensing with so important an aid to his success.

In connection with this subject of education, the question will soon arise, how far the multiplication of Colleges of Pharmacy will conduce to the advantage of the cause. The expense to the student, residing in a distant locality, of a long journey and residence for two winters in Philadelphia or New York, in attendance on lectures, constitutes a great obstacle to the extension of this advantage. Candidates for the drug business are very often in the humble walks of life, and unable to meet so heavy a drain upon their slender resources in anticipation of any means of revenue from their business; and yet as an encouraging sign of the times, it may be mentioned that rapidly increasing numbers annually seek these advantages in Philadelphia. Against the establishment of numerous schools of Pharmacy, at present, their lie many objections, founded upon the difficulty of maintaining them as yet, and upon the almost inevitable lowering of the standard of graduation consequent upon this kind of competition; but it can hardly be doubted that in the future, should the stimulus of our national and subordinate organizations be steadily maintained, the demand for pharmaceutical education will require the services of numerous scientific teachers in different and widely separated localities.

In connection with pharmaceutical education, there are many subjects which will be found to press themselves on the attention of our organizations. The selection of suitable candidates for apprenticeship, with the requisite preliminary education; their careful training in the shop, the course of reading upon elementary science, which will be best adapted to prepare them for the College, should all be determined upon, with the best lights we can command. The establishment of preliminary schools, labora-

tories and libraries in connection with local organizations, the obligation of the employer to furnish facilities for study, and of the student to avail himself of them, will have to be so insisted upon, as to render effective the work of reform now begun. We should encourage teachers capable of giving direction to the work of education, to enter this field; let our enterprising young men aspire to impart scientific knowledge. Who is so capable of instructing the physician as well as the pharmacist in materia-medica, chemistry and pharmacy, as the well-educated apothecary? who, by his pursuits, and the tastes that grow out of them, is so peculiarly connected with those departments of knowledge which are common to a medical and pharmaceutical education? If we would reach the position to which we are entitled, we must cut loose from that vassalage to physicians, which has been too much encouraged and still keeps us down. Let us do our own teaching, and wherein we are the equals or the superiors of our medical brethren, let us not fail to assert our claims. The profession of Pharmacy lacks self-respect, and this is one reason it is not more respected by the public.

A measure fraught with a high degree of interest and importance, as calculated to promote an improved condition of our art, and to lead to an honorable emulation among its practitioners and students, has already been suggested in the American Pharmaceutical Association; it has for its object the offering of prizes for the best essays, both theoretical and practical. The subjects should be selected with a view to drawing out all degrees of scientific attainment, and a wide publicity being given to the papers in connection with their author's name, would operate as a further incentive to competition, in this very important line of effort. Those which require illustration, and which are connected with the display of apparatus and of improved processes, should be read publicly at the annual meetings, an additional charm, connected too with practical advantages, would thus be imparted to these gatherings.

The cultivation of a pharmaceutical literature among ourselves, which shall make pharmacology, instead of a secondary branch of medical knowledge, a distinct department of science pertaining to a distinct profession, is an object greatly to be desired and promoted by every legitimate effort. In connection with this, we should

not overlook the utility of diffusing among the people a knowledge of the true relations of Pharmacy. The experiment would well repay a trial, of purchasing a place in the popular newspapers wherein correct views should be diffused, as a sort of antidote to the puffs of quackery. This, of course, would require great skill and judgment; it should be done without the appearance of antagonism, without any pointed allusions, but in a manly and dignified spirit, with a direct view to diffusing a knowledge of the true nature of the healing art, and of the injurious consequences of too free and indiscriminate use of medicines. The druggist and physician, unlike the quack, have nothing to fear from the diffusion of light among the people, and I believe in this would be found our strongest weapon against quackery.

(To be continued.)

PULVIS FERRI—IRON BY HYDROGEN.

By WILLIAM PROCTER, JR.

There has recently been considerable discussion in the London Pharmaceutical Journals, as to the composition of the substance, sold as Quevenne's metallic iron, and as manufactured by Mr. Morson and Mr. Heathfield, both of London. Having for several years been a manufacturer of this preparation, although not now so engaged, it may be appropriate to say a few words in relation to the subject at issue.* It appears (Pharm. Jour. page 333, Jan. 1854,) that iron reduced by hydrogen made by both the gentlemen named, was on sale in Edinburg by different pharmacutists. Messrs. Duncan, Flockhart & Co., who sold the preparation of Mr. Morson were complained to, that their iron was not *black* like that of Mr. Robinson made by Mr. Heathfield. Messrs. D. F. & Co., then forwarded to Mr. Morson a sample of the black iron, and he pronounced it magnetic oxide of iron, and not metallic iron. On this Mr. Robinson placed samples of both kinds in the hands of Dr. George Wilson of Edinburgh, who pronounced both to be impure, that is, contained oxygen, but that Heathfield's was 7 per cent. purer than Morson's. On this being published in the *Chemist*, Mr. Morson obtained a specimen of Heathfield's iron

* See a paper by the Author, Amer. Journ. Pharm., vol. xix. p. 11.

as sold in Edinburgh, and had it analysed by Dr. Gregory, Dr. Stenhouse, Prof. Williamson and Dr. Garrod, all of whom pronounced it to be magnetic oxide of iron, and published the whole affair in the *Pharmaceutical Journal* of January. In the next number, Mr. Heathfield pursues the subject by bringing forward microscopical evidence, and vindicates the *black* iron from the charge of impurity, attributing its color to minuteness of division, rather than to magnetic oxide, and endeavors to throw doubt on the correctness of the four analyses obtained by Mr. Morson. And finally Dr. George Wilson appears in the March number, reasserts the correctness of his analyses, and claims for specimens of the preparation of Mr. Heathfield, since examined, the strength of 91 and 98½ per cent. of metallic iron.

By one who is practically familiar with what takes place in the process of reducing iron by hydrogen, the causes of the controversy above noticed, are easily explained. The reduction tube, when ready for the operation, is nearly filled with red oxide of iron, obtained by calcining the sub-carbonate of iron of the *Pharmacopœia*, to free it from its water of hydration. After the current of hydrogen is established and the fire is kindled, the operator is made aware of the commencement of the reduction by the appearance of aqueous vapors at the exit pipe; and when it is continued for a length of time and stopped, the contents of the tube will vary considerably, in appearance. Near the point of ingress of the gaseous current, if the heat has been sufficient, the red powder will have assumed an iron gray color, whilst further along, the color will be blacker, and finally perfectly black. If the tube and contents have not been heated to a dull red, the reddish color of the oxide will be retained at such point, and it sometimes happens in the same operation, that the unreduced oxide and all the grades of reduction to the perfect metallic state, may be observed. It never happens in practice, that all the oxide is reduced, as the fire would have to be continued too long, to the injury of the reduced portion, and it is usual to employ the partially reduced oxide of one operation for the next. The line of complete reduction is distinctly marked, so that the chemist can by means of a spatula separate readily the perfectly reduced iron; yet between this and the black oxide there is a portion consisting of metallic iron and oxide in variable proportion.

Hence there is no reason why imperfectly reduced iron should be sold except either through ignorance of the process, carelessness or fraud. Mr. Heathfield, therefore, in alleging the action of hydrogen in a hot tube as a reason for purity, is only conditionally correct.

It sometimes happens in operating in a 4 inch tube, that the interior particles in a part of the oxide are black, and the exterior iron grey. Now in reference to color, it may be said that no metallic iron is *perfectly* black; but when the oxide is reduced at the lowest heat possible, so that its particles do not contract or weld together by excess of heat, after reduction, it is of a dark iron grey hue, and will dissolve, with rapid effervescence of hydrogen in dilute sulphuric acid like a carbonate; when, however, the heat has been allowed to become cherry red, after the reduction, the particles contract more and more, until, if the heat has been continued long enough, a metallic mass is obtained, difficult to powder, and requiring the avoidance of blows of the pestle to prevent its condensation into solid shining pebble-like masses. The color of over-heated iron is light iron grey, with a peculiar lustrous appearance, derived from the trituration necessary to pulverize it.

Now when the operator opens his tube and finds that he has but a partial product, and that the interior part of the oxide is not thoroughly reduced, he is tempted to overlook the presence of the latter, and convert all to powder. This may be occasional and accidental, or habitual, according to the conscientiousness or knowledge of the manufacturer, and whilst this is the case, iron by hydrogen will constantly vary in composition; we see by the analyses of Dr. Wilson admitted by Mr. Heathfield, that his own preparation varies from 2 to 22 per cent of foreign matter.

Undoubtedly, the best condition of this preparation, when removed from the tube, is that of a light spongy mass, like light carbonate of magnesia, yet more compressible, and of a dull, rather dark iron grey color. When a fragment is struck on a bright anvil with a smooth hammer, a thin brilliant lamina of metal is obtained, and when the powder is strongly pressed with a bright spatula, with traction, the compressed surface exhibits a metallic lustre.

It may be well to say a word in reference to the sulphur

found in reduced iron: it may arise from two sources; 1st, from the presence of sulphureted hydrogen in the hydrogen used, when the sulphuret present is that of iron; or it may be due to the deoxidation of sulphate of soda in the oxide of iron, when sulphuret of sodium is the sulphuretted body, as may be proved by washing the iron. It is almost impossible, on a manufacturing scale, to wash all the sulphate of soda from the hydrated carbonate of iron in the process of making the sub-carbonate, hence it is necessary to thoroughly wash the dried sub-carbonate after it is pulverized, till the washings are free from sulphate. The success of this operation is known by testing the reduced iron with dilute sulphuric acid, when, if any sulphuret is present, the odor of hydro-sulphuric acid is perceptible.

In my experience in operating with a wrought-iron tube forty inches long and four inches diameter, the charge of oxide is six to eight pounds, and the hydrogen is furnished by the solution of twelve pounds of zinc in dilute SO_3 . The current is kept up rapidly for eight hours, during which time the tube is kept at as near a dull red heat as possible; and after the removal of the fire and the cooling of the walls of the furnace with water, the evolution of gas is moderated to a slow bubbling at the exit end, until the tube is *perfectly cold*. The yield of reduced iron on the average, is between two and four pounds to an operation. The black pulverulent oxide in the other end of the tube is used for part of the next charge. The most difficult point in the process is the regulation of the heat; the next, the management of the gas, which should be carefully purified by passing it twice through a solution of subacetate of lead.

PHARMACEUTICAL GLEANINGS.

The following formula has been received from Mr. Charles T. Bonsall of Trenton, New Jersey.

Solutio Doveri. (Liquor Morphiæ Compositum.)

Take of Acetate of Morphia,	one drachm.
Diluted acetic acid,	one fluidounce.
Dissolve, and add	
Diluted alcohol,	seven fluidounces.
Wine of ipecac.	two fluidounces.

The above preparation originated, I believe, with Dr. J. B. Coleman, of Trenton, N. J., and was intended to represent the Pulvis Doveri in those cases where it is difficult to administer the latter compound from an irritable condition of the gastric organ. It is an elegant preparation, and a favorite with those who are in the habit of prescribing and using it. It is kept at the shops and dispensed with directions for use, being considered preferable to the ordinary preparations of opium, for not being apt to cause nausea, headache or constipation of the bowels.

Ten minims of the preparation are equivalent to one-eighth of a grain of acetate of morphia, and one-eighth of a grain of ipecacuanha, and fourteen minims equal a grain of opium.

The literature of the shop.—The following is a literal copy of a prescription recently sent to a drug store in Philadelphia. It may serve to show one feature of the dangers to which our fellow-citizens are exposed by such ignorance, and that the druggists are not always the only ones accountable for the many mistakes that occur in dispensing.

“R Portocholorid gr. vi.
 Cholchochum gr. x.
 M. and pill, iii.
 R Tart. potash ʒj.”

The latter item was, of course, taken to mean what it said, but “the doctor” sent word back, that he “wanted Cream of Tartar!”
Risum teneatis, amici?

Febrifuge properties of the Olive.—Mr. Daniel Hanbury, in the *Pharmaceutical Journal* for February, 1854, gives the following information from Mr. Sidney H. Maltass of Smyrna.

“ * * * I may here tell you of a discovery I made in 1843, which has proved valuable. I was in the island of Mytelene, and at a time when fever and ague of the worst description were raging in the island;—in fact, it was so bad that death ensued frequently after a week or ten days. The small quantity of quinine at the druggist’s was soon exhausted, and I could procure none to administer to patients. Knowing that biberine and salicine were often used for fever and ague, I turned over in my mind all the bitters I could think of which might prove effectual. Many were poisonous, and I rejected them, then thought of *olive leaves*, and after several trials made on myself, I commenced administering doses of a decoction of the leaves, say two handfuls boiled in a quart of water till evaporation had reduced it to a pint. This I gave in doses of a wine-glassful every three or four hours. Obstinate cases of fever gave way before it; and for many years I have found it more effectual than quinine.

“I have recommended it to our medical men, and although at first they ridiculed the idea, they all use it now. It is a most valuable remedy for the poor in an olive-growing country.”

Mr. H. considers this discovery more interesting as corroborating some observations made many years since in France.

According to Dr. Pallas, the olive leaves and bark contain a bitter crystallizable principle which communicates a faint blue color to reddened litmus paper. The bark contains two per cent.

The pharmaceutical preparations of olive leaves are a tincture (1 to 8) and an alcoholic extract.

Hydrocotyle Asiatica, a cure for Leprosy.—Dr. Boileau of Mauritius, afflicted with leprosy, employed the leaves of the *Hydrocotyle Asiatica* with decided success in his own and other cases. M. Lepine, of Pondicherry, has corroborated the statement of Dr. Boileau, as to the usefulness of this plant in leprosy, at the Leper Hospital. It is taken in powder, decoction and syrup, and its use continued several weeks.

Hydrocotyle Asiatica is an umbelliferous plant growing extensively in Asia, and has been used before the present application of it in India, as an alternative for children. Those who wish to learn further of this remedy, are referred to Pharm. Jour. xiii. page 427, which contains a long extract in relation to it from the Madras Gazette.

ON THE INCOMPATIBILITY OF IODIDE OF POTASSIUM WITH CALOMEL AND OTHER PREPARATIONS OF MERCURY, AND ON A SIMPLE MODE OF TESTING PILLS, POWDERS, AND OTHER MEDICINES FOR THE PRESENCE OF MERCURY.

By WILLIAM PROCTER, JR.

It frequently happens that iodide of potassium is prescribed with calomel, blue mass, and other mercurials, directly or indirectly, and it is well worthy the consideration of physicians to discover what changes occur by their contact in the stomach or circulation, and how far the action of a mercurial is modified, and its effects accelerated or retarded. To make the subject clearer, let us see what changes may and do occur in the test tube, that medical men may draw what conclusions the premises will warrant, with regard to the reactions that may occur in the human system.

1st. When calomel and iodide of potassium, in equivalent proportions, are treated with boiling water, chloride of potassium is

found in solution, and green protiodide of mercury remains insoluble. When they are treated with cold water, the same change occurs more slowly. HgCl and KI , becoming HgI and KCl .

2d. If, however, the iodide of potassium is in excess, the protiodide of mercury is converted into biniodide and metallic mercury, the former immediately combining with a part of the excess of iodide to form soluble iodohydrargyrate of potassium. 2HgI and 2KI yield $2\text{KI}, \text{HgI}^2$, and Hg .

3d. When black oxide of mercury is added to an excess of iodide of potassium, it is converted first into protiodide, and this subsequently decomposed into biniodide and metallic mercury, part of the iodide of potassium suffering decomposition to yield the iodine which is replaced by oxygen, so as to form free potassa; thus, 2HgO and 2KI , become 2HgI and 2KO . Then the protiodide and excess of iodide of potassium react as above, to produce free mercury and iodohydrargyrate of potassium.

4th. When red oxide of mercury is added to an excess of iodide of potassium, they are first, by double decomposition, converted into biniodide of mercury and potassa, and the former then into iodohydrargyrate of potassium, whilst free potassa is found in the clear solution which is strongly alkaline; thus HgO^2 and 4KI become $2\text{KI}, \text{HgI}^2$ and 2KO .

5th. When subsulphate of mercury (turpeth mineral) is mixed with an excess of iodide of potassium, in strong solution, the yellow salt is instantly turned red by the formation of biniodide, which is gradually dissolved—the change may be represented by the following equation: $3\text{HgO}^2, 2\text{SO}^3$ and 12KI yield $3(2\text{KI}, \text{HgI}^2) + 2(\text{KO}, \text{SO}^3) + 4\text{KO}$, the solution being strongly alkaline.

6th. When white precipitate is mixed with an excess of iodide of potassium it soon dissolves—the solution smells of ammonia.

7th. When blue mass is digested with a solution of iodide of potassium, the filtered liquid has an alkaline reaction, and contains mercury, as evidenced by its precipitation, when a drop is placed on a bright copper.

Lastly, When mercury is boiled with a strong solution of iodide of potassium, and filtered, the solution contains mercury, and is decidedly alkaline. It follows, therefore, that iodide of potassium is decomposed with the formation of biniodide of mercury and potassa, yet the rationale is not very clear, inasmuch

as no evolution of hydrogen is apparent. The same occurs more slowly without heat. In every instance, a drop of the above solution put on bright copper, instantly precipitates mercury and causes a silvery stain.

Now it is well known that iodide of potassium proves useful in cases where mercurials have been taken to abuse; do not the reactions above detailed show that in every ordinary form of mercurial, this salt exerts a solvent power, which, in connection with its ready elimination by the bladder, may prove efficacious by acting as a collector of the metal in whatever form of combination it may exist in the system? Do they not suggest that physicians should observe due care in the use of calomel, protiodide of mercury and blue mass, in connection with iodide of potassium, as the iodo-hydrargyrate of potassium, which is formed by this reaction, exhibits its peculiar effects in doses of one-twelfth of a grain?

It would probably repay the time occupied in the observations, if some of our medical friends would watch the effect on the composition of the urine in cases where iodide of potassium was being administered, as in old syphilitic cases, where mercury had been used to excess.

Before concluding, it is proper to state that my attention was directed to the subject by the statements of Mr. Morgan on the use of iodide of potassium as a test of mercury, (see Am. Jour. of Pharm., xxiv. pp. 177.) This test is admirably calculated to discover the presence of mercury in any form in a medicine, as in pills, powders and mixtures; and especially for demonstrating the presence of the metal in those *vegetable* QUACK PILLS which sometimes act so much like the mercurial purgatives.

All that is necessary is to take a penny, dip it in nitric acid to produce a bright, clean surface, scrape on to the penny about a grain of the pill to be tested, add to it three grains of iodide of potassium and three drops of water, and mix them with the point of a penknife. If mercury is present, a silvery stain will be found on the copper. Where the metal exists as blue pill, the reaction requires more time, but it is equally certain. The experiment can easily be tried with a compound cathartic, or a Plummer's pill.

ON THE MANUFACTURE OF AMMONIA AND AMMONIACAL SALTS.

(Concluded from page 139.)

A great variety of processes have been patented within the last few years by Mr. Laming and Mr. Hills, having for their object the purification of coal gas and the obtaining of ammonia and ammoniacal salts. In his patent of November 4, 1847, Mr. Laming claims the use of the undermentioned salts for the above named purposes, the solution of which is absorbed into sawdust, or other porous material, and placed in the purifying vessel of the gas-works—viz., chloride of calcium, the muriates and sulphates of manganese, iron, and zinc; the carbonates of manganese, iron, zinc and lead. The oxides of manganese, iron, zinc, or lead, may also be added to any of the above materials. The ammonia or ammoniacal salts contained in the spent purifying materials may be removed by heat or washing.

The specification of the same patent contains an account of certain modes of treating the ammoniacal liquor of gas-works, so as to obtain from it the sulphate of lead, a solution of sulphate of ammonia, and either an oxide or carbonate of lead, of sufficient purity to serve as, or be converted into, white lead.

Mr. Laming converts the hydrosulphate of ammonia contained in gas-liquors into carbonate of ammonia by the following process:—A mixture of deutoxide of copper and charcoal, or other form of carbon in fine powder, in the proportion of twelve parts by weight of the former to one of the latter, is introduced into a retort made red-hot and furnished with an eduction-pipe, which passes through cold water, and finally enters into the gas-liquor. The formation of carbonic acid gas soon takes place by the union of the carbon with the oxygen of the metal, and this gas combining with the base of the hydrosulphate of ammonia contained in the gas-liquor, converts it into carbonate, with liberation of hydrosulphuric acid. When the carbonic acid gas ceases to come away, nearly all the carbon will have disappeared from the retort, and the copper which it contains become reduced to the metallic state. The charge is then drawn and left to cool, while a second charge of similar materials is being worked off, during which time the copper re-absorbs oxygen from the air, and becomes again deutoxide of copper, which may then be used anew with fresh carbon.

Mr. Hills, in his patent of Nov. 28, 1849, claims the use of the sub-sulphates, the oxychlorides, and the hydrated or precipitated oxides of iron (which he prefers to use in a rather damp state), either by themselves or mixed with sulphate of lime, or sulphate or muriate of magnesia, baryta, strontia, potash, or soda; and he causes them to be absorbed into or mixed with sawdust or peat charcoal in coarse powder, or breeze, or other porous or absorbent material, so as to make a very porous substance easily permeable by the gas. This material is to be put into a purifier (a dry lime purifier will answer the purpose) and the gas is to be passed through it; by this means the ammonia and other products are absorbed. By the admission of air and application of heat to the material so saturated with ammonia, this substance is driven off and collected by passing it through a condenser, or the ammonia may be fixed by an acid and converted directly into sulphate or muriate of ammonia. If sulphate of lime or sulphate of magnesia be present in the purifying material, these salts will be decomposed with the formation of sulphate of ammonia, which may then be washed out of the purifying material, concentrated by evaporation, and crystallized.

Mr. Laming, in his patent of April 23, 1850, claims the use of muriate of iron, of muriate of iron decomposed by lime into chloride of calcium and oxide of iron, of sulphate of iron decomposed by its equivalent quantity of chloride of sodium, adding to the solution of muriate of iron thus produced, enough hydrate of lime to decompose it into chloride of calcium and precipitated oxide of iron. In these, and in various modified forms of the same process, muriate of ammonia may be obtained from the purifying material when it has served its purpose, and has been removed from the purifying vessel. Mr. Laming also claims the use of a mixture of sulphate of lime and sulphate of iron, of a mixture of hydrated or precipitated oxide of iron with carbonate of lime, magnesia, carbonate of magnesia, or magnesian limestone, or chloride of magnesium or sulphate of magnesia and water, phosphate of lime dissolved in hydrochloric acid, and, lastly, of a mixture containing sulphate of magnesia or chloride of magnesium or calcium, or one or more of them in combination with oxide of copper, and mixed or not with lime or magnesia, or both or either, or both of the carbonates of those earths. In

all these cases, the salts employed are mixed with sawdust or some other porous substance, and the material so compounded is placed in the purifying vessels of the gas-works. The gas in its passage through the purifiers gives up its ammonia, which is afterwards obtained as sulphate or muriate of ammonia, by washing the material when it has become fully saturated with ammonia.

Messrs. Crane and Jullien, in their patent of January 18, 1848, describe a method of manufacturing ammonia in the state of carbonate, hydrocyanate, or free ammonia, by passing any of the oxygen compounds of nitrogen, together with any compound of carbon or even free hydrogen, through a tube or pipe containing any catalytic or contact substance, as follows:—Oxides of nitrogen (such for instance as the gases liberated in the manufacture of oxalic acid), however procured, are to be mixed in such proportion with any compound of carbon and hydrogen, or such mixture of hydrogen and carbonic oxide or acid as results from the contact of the vapor of water with ignited carbonaceous matters, and the hydrogen compound or mixture containing hydrogen, may be in slight excess, so as to ensure the conversion of the whole of the nitrogen contained in the oxide so employed, into either ammonia or hydrocyanic acid, which may be known by the absence of the characteristic red fumes on allowing some of the gaseous matter to come in contact with atmospheric air. The catalytic or contact substance which Messrs. Crane and Jullien prefer, is platinum, which may be either in the state of sponge, or asbestos coated or covered with platinum. This catalytic substance is to be placed in a tube, and heated to about 600° Fahr., so as to reduce the temperature of the product, and at the same time prevent the deposition of carbonate of ammonia, which passes onwards into a vessel of the description well known and employed for the purpose of condensing carbonate of ammonia. The condenser, for this purpose, must be furnished with a safety-pipe to allow of the escape of uncondensed matter, and made to dip into a solution of any substance capable of combining with hydrocyanic acid or ammonia where they would be condensed. A solution of salt of iron is preferable for this purpose.

Mr. Hills took out a patent, October 19, 1848, for improvements in treating certain salts and gases or vapors, in which he

describes a method of distilling the volatile solution of ammonia for the purpose of producing ammonia of a more highly concentrated character. For this purpose he employs a tower, circular by preference, which should be about ten diameters in height; this is to be furnished with gratings, placed from three to four feet apart throughout the whole height of the tower; the spaces between each being filled with coke, pieces of earthenware, or other substances, to form greatly divided media. The volatile solution to be distilled, whether pure or combined with other matters, is to be introduced at the top of the tower, and allowed to percolate through the coke, while, at the same time, a jet of steam or heated air is introduced at the bottom, which, in its ascent, meets the ammonia distributed over a great amount of surface, by which means the more volatile parts of the ammonia become vaporized and carried off by the steam; this being collected at the top and conveyed to a refrigerator and condensed, while the waste liquor escapes at the bottom of the tower. As an auxiliary to this apparatus, another tower is placed on the top of that already described. This the patentee calls a concentrator: it is filled with the same materials as the other, and furnished with a coil of pipe, through which the solution of ammonia is to be passed when introduced to the lower tower; the vapors arising from this partially vaporize the ammonia in the pipe, while, at the same time, the more aqueous parts of the vapors are condensed before passing off to the condenser.

Dr. Richardson's process, patented January 26, 1850, for manufacturing sulphate of ammonia, consists in subliming the double salt of sulphate of magnesia and ammonia obtained by the following method:—The ammoniacal liquor of the gas-works is added to a solution of sulphate of magnesia, with application of heat, until the solution is rendered nearly neutral; the precipitate is then allowed to subside, and the clear liquor drawn off, concentrated by boiling to from 50 to 60° Twaddle (spec. grav. 1,250 to 1,300), and crystallized. If preferred, the gas-water may be neutralized by sulphuric acid before it is added to the solution of sulphate of magnesia. The double salt of sulphate of magnesia and ammonia may also be obtained, by subjecting the sulphate of magnesia, either in solution or in a damp state, to a current of ammoniacal gas, obtained by the distilla-

tion of gas-water, guano, or any other matter from which ammonia can be procured by destructive distillation with quicklime; the ammoniacal gas being purified before use by passing it through water.

Michiel's mode of obtaining sulphate of ammonia, patented April 30, 1850, is as follows: The ammoniacal liquors of the gas works are combined with sulphate and oxide of lead, which is obtained and prepared in the following way: Sulphuret of lead in its natural state is taken and reduced to small fragments by any convenient crushing apparatus. It is then submitted to a roasting process, in a suitably arranged reverberatory furnace of the following construction: The furnace is formed of two shelves, or rather the bottom of the furnace and one shelf, and there is a communication from the lower to the upper. The galena or sulphuret of lead, previously ground, is then spread over the surface of the upper shelf, to a thickness of about 2 or 2½ inches, and there it is submitted to the heat of the furnace. It remains thus for about two hours, at which time it is drawn off the upper shelf and spread over the lower shelf or bottom of the furnace, where it is exposed to a greater heat for a certain time, during which it is well stirred, for the purpose of exposing all the parts equally to the action of the heat, and at the same time the fusion of any portion of it is prevented. By this process the sulphuret of lead becomes converted, partly into sulphate and partly into oxide of lead. This product of sulphate and oxide of lead is to be crushed by any ordinary means, and reduced to about the same degree of fineness as coarse sand. It is now to be combined with the ammoniacal liquors, when sulphate of ammonia and sulphuret and carbonate of lead will be produced.

In order to obtain sulphate and muriate of ammonia with the greatest possible economy, Mr. Spence patented, November 12, 1850, the following process:—A series of two or more, say for instance four cylindrical boilers are placed at such a distance, one above the other, that the contents of the upper boiler may be drawn off into the one next below it. Each boiler is furnished with a cock, to allow of the passage of the contents of the boiler from one to the other throughout the series. Each of these vessels contains gas-liquor, from a reservoir of which a pipe

passes to the upper boiler, which is also furnished with an exit-pipe. Into the lower boiler high-pressure steam is passed, which soon causes the gas-liquor to boil, and the vapor of ammonia and water passes off through an exit-pipe into the boiler placed next above it in the series, the liquor in which is thus also brought to boil, the vapor of ammonia and water passing off from it in the same way to the boiler next above it, and so on throughout the series. By the time the vapor of ammonia passes off from the uppermost boiler it has become so concentrated, that on passing it into sulphuric or muriatic acid, a concentrated solution of either of those salts is obtained, of sufficient specific gravity to crystallize without evaporation, and thus a considerable saving in fuel and time is effected, and the ammoniacal gas-liquor is most thoroughly exhausted. Fresh supplies of ammoniacal liquor are constantly furnished to the uppermost boiler from the reservoir; whilst the partially exhausted liquors are run from the higher to the lower vessels in succession, and the exhausted liquors run off to waste from the lowermost vessel of the series. As the gas-liquors often contain some fixed ammoniacal salts, Mr. Spence recommends the addition of lime to the contents of the boilers, in order to render free the ammonia contained in such salts.

Mr. Wilson patented, December 7th, 1850, the following process of obtaining sulphate of ammonia from the waste products of coke-ovens and other furnaces. For this purpose he employs the following apparatus:—An iron column lined with lead, or a brick column lined with fire-bricks and well burnt clay, is filled with coke or round pebbles; this column has an area or cross section five or six times that of the chimney connected with the coke-ovens, and is from twelve to fifteen feet in height; at the bottom of this column, which can be supported on cross bars, is a space of three feet left clear, in which is placed a cistern, constructed of the same materials as the column, and another similar cistern is placed at the top of the column, its bottom being pierced full of holes. The lower cistern is then filled with sulphuric acid so diluted, that, when saturated with ammonia, it shall not form a solution of sufficient density to cause, on evaporation by the heat of the column, an incrustation of sulphate of ammonia. The gaseous products of combustion are then made to pass through the lower cistern up the column of coke, and as

the acid liquor of the lower cistern is continually forced by suitable means into the upper perforated cistern, the ammonia in its passage upwards comes into contact with the acid trickling down through the column, and is thus prevented from passing off with the other products of combustion, which are conveyed by an exit-pipe into the chimney. When the acid liquor has become neutralized by ammonia, it is drawn off, filtered, evaporated, and crystallized, a fresh supply of acid being placed in the lower cistern.

Mr. Laming patented, August 12th, 1852, the following method of manufacturing sulphate of ammonia from the ammoniacal liquors of gas-works. The ammonia is first separated in its simple form, or as carbonate of ammonia, by any known means, after which it is converted into sulphate of ammonia, by causing streams of sulphurous acid to be brought into contact with it, and the sulphite of ammonia is finally converted into sulphate by exposing it to the combined influences of atmospheric air and water.

Dr. Ure, in his *Dictionary of Arts and Manufactures*, states that 7200 gallons of ammoniacal gas-liquor treated with 4500 lbs. of sulphuric acid, sp. grav. 1.625, produces 2400 gallons of solution of sulphate of ammonia, of sp. grav. 1.150. As a gallon of solution of ordinary sulphate of ammonia, of the above strength, contains three pounds of crystallized sulphate, it follows that in the above case the product is at the rate of one pound per gallon of gas-liquor, which is almost double the quantity ordinarily obtained.

The quantity of ammoniacal liquor obtained at one of the London gas-works, during one year, from the distillation of 51,100 tons of coal, was 224,800 gallons.

Ammonia Meter.—In order to determine the strength of any given solution of ammonia, Mr. J. J. Griffin, of Baker street, has constructed a useful instrument, termed an ammonia meter. This instrument is founded on the following facts: That mixtures of liquid ammonia with water possess a specific gravity, which is the mean of the specific gravities of their components; that in all solutions of ammonia, a quantity of anhydrous ammonia, weighing $212\frac{1}{2}$ grains, which he calls a *test-atom*, displaces 300 grains of water, and reduces the specific gravity of the

solution to the extent of .00125; and, finally, that the strongest solution of ammonia which it is possible to prepare at the temperature of 62° Fahr., contains in an imperial gallon of solution one hundred test-atoms of ammonia.

The ammonia meter is accompanied by a table, containing six columns of numbers. The first column shows the *specific gravity* of the solutions; the second column the *weight* of an imperial gallon in pounds and ounces; the third column the *percentage* of ammonia by weight; the fourth column the *degree* of the solution, as indicated by the instrument, corresponding with the number of *test-atoms* of ammonia present in a gallon of the liquor; the fifth column shows the number of *grains* of ammonia contained in a gallon; and the sixth column the *atomic volume* of the solution, or that *measure* of it which contains one test-atom of ammonia. For instance, one gallon of liquid ammonia, sp. grav. 880 weighs 8 lbs. 12.8 oz. avoirdupois, its percentage of ammonia, by weight, is 33.117, it contains 96 test atoms of ammonia in one gallon, and 20400.0 grains of ammonia in one gallon; and, lastly, 104.16 septems containing one test atom of ammonia. Although no hydrometer, however accurately constructed, is at all equal to the centigrade mode of chemical testing, yet the Ammonia Meter and the table accompanying it, will be found very useful to the manufacturer, enabling him not only to determine the actual strength of any given liquor, but the precise amount of dilution necessary to convert it into a liquor of any other desired strength, whilst the direct quotation of the number of grains of real ammonia contained in a gallon of solution of any specific gravity, will enable him to judge at a glance of the money-value of any given sample of ammonia.—*Pharm. Journ.* Sept., 1853.

CONSTITUTION OF THE "MELT" OBTAINED IN THE MANUFACTURE OF FERROCYANIDE OF POTASSIUM.

Liebig is of opinion that the raw product of melting contains no ferrocyanide, but only cyanide of potassium, while Gmelin, Runge, and others, adopt a contrary view. The results referring to the subjects which have hitherto been obtained, are very contradictory, and for this reason Reimann has, at the sugges-

tion of Professor Fresenius, instituted a number of experiments on the "melts" obtained from several factories, and the behavior of these various ingredients in the presence of water. These experiments have fully confirmed the opinion that the fresh and still warm "melt" does not contain any ferrocyanide, and that this salt is formed only by the action of water or moist air upon the melt.

Melt from the Buxweiler factory (Bas Rhin.)—Apparently produced at a very high temperature; very hard, fracture presenting small crystals of sulphuret of iron.

1. Alcohol dissolved out sulphocyanide and much cyanide of potassium, with a little caustic potash.

2. The residue, after perfect exhaustion with alcohol, was then treated with cold water; the first portion of liquid contained much cyanide of potassium, sulphuret of potassium, and carbonate of potash, sulphuret of copper dissolved in cyanide of potassium, and minute traces of ferrocyanide of potassium. The second portion of liquid contained the same substances, the proportion of ferrocyanide being greater. The residue consisted of carbon, sulphuret of iron, metallic iron, and carburet of iron.

3. A portion of the melt was digested for twenty-four hours with water, air being excluded. The solution obtained contained besides cyanide of potassium a tolerably large quantity of ferrocyanide.

4. A portion of the moistened melt was exposed to a stream of carbonic acid in a closed apparatus, and the evolved gas passed through an acidulated solution of silver. In this way, sulphuret and cyanide of silver were precipitated, which proves that the melt contained cyanide of potassium, for carbonic acid does not disengage hydrocyanic acid from solutions either of sulphocyanide or ferrocyanide of potassium.

5. A portion of the melt was treated with water in a flask at a temperature of about 122° Fahr. A very small evolution of ammonia was observed, and the solution contained a large quantity of ferrocyanide, together with some cyanide of potassium.

6. Another portion was boiled for some time with water in a retort. The evolution of ammonia was considerable, and the solution contained a great quantity of ferrocyanide of potassium.

7. A portion of the melt was digested with water in a small gas generator at 212° F., and the gas evolved passed first through

water and then through a tube filled with asbestos, moistened with hydrochloric acid. After the lapse of twenty-four hours the solution yielded hydrocyanic acid when treated with bichromate of potash (to destroy the smell of sulphureted hydrogen) and sulphuric acid. A faint ammoniacal odour was likewise perceptible at the end of three, four, and even five days, when the presence of cyanide of potassium in the solution could be distinctly recognized.

8. The melt which had been treated in this manner for seven days, was mixed with freshly precipitated sulphuret of iron, and at the end of twenty-four hours the solution no longer contained cyanide of potassium.

9. About twenty grm. of the melt were digested with about three grm. of fused potash and water in the same apparatus, at 212°F. , and after twenty-four hours the solution still contained cyanide of potassium, which did not entirely disappear even after the lapse of seven days.

10. The above mass was then mixed with fresh precipitated sulphuret of iron, and within twenty-four hours all the cyanide of potassium was converted into ferrocyanide.

The melts from other factories gave corresponding results.

Cyanide of Potassium (prepared according to Liebig's method), digested with fresh precipitated sulphuret of iron and water, was entirely converted into ferrocyanide within two days.

When digested with fresh sulphuret, caustic potash, and water the change of the cyanide into ferrocyanide was completed within twenty-four hours.

It appears from the above experiments that it is chiefly the finely divided amorphous sulphuret of iron which determines the rapid conversion of the cyanide into ferrocyanide, while the crystalline sulphuret (contained in many melts produced at a high temperature) acts much more slowly. Consequently the presence of sulphuret of potassium in the melts is a favorable element in the formation of ferrocyanide of potassium, for then on the addition of sulphate of iron fresh precipitated sulphuret of iron is produced.

A temperature varying from 158° to 176° F. appears to be the most favorable for the extraction of the melt, for at that temperature the formation of ammonia is but small, and the solvent action of the water is considerably augmented.

There is apparently no doubt that the presence of caustic potash facilitates the conversion of cyanide of potassium into ferro-cyanide.—*London Pharm. Journ.*, March, 1854.

PREPARATION OF PARAFFIN AND PURE ACETIC ACID UPON
A LARGE SCALE FROM THE DISTILLATION PRODUCTS OF
WOOD.

By REINHOLD V. REICHENBACH.

The author having had occasion to prepare a large quantity of pure paraffin, was desirous of adopting some less tedious process than that by which his father obtained this substance in the first instance. Under these circumstances he was induced to try the action of sulphuric acid at a high temperature, supposing that it would then be more efficacious in destroying the empyreumatic substance mixed with the paraffin. For this purpose he half-filled a large glass retort with fuming sulphuric acid, and added one-third its weight of well pressed raw paraffin. The temperature was gradually raised in a sand bath until distillation began, and after a time he found that the whole of the paraffin had passed over and presented an appearance of perfect whiteness and purity.

From the success of this operation, he applied the method to the preparation of pure acetic acid. The substance employed was the ordinary raw acetate of soda. This salt, containing a large quantity of empyreumatic resin, yielded, when distilled with concentrated sulphuric acid, about half its quantity of very strong acetic acid, which was clear, perfectly colorless, and free from any empyreumatic odour. It was not until the temperature was raised, in order to continue the distillation, that the distillate began to present a brownish-yellow color, and at the same time a peculiar turbidity. Both these circumstances appeared to be owing to some other cause than the presence of empyreumatic admixtures, and they were found to result from a decomposition of sulphuric acid, by the carbonaceous matter in the retort, and a consequent distillation of sulphur with the acetic acid. The turbid and somewhat colored acid was rendered perfectly pure by redistillation.

The author then endeavored to conduct the distillation in such a manner as to prevent this inconvenience. The layer of acetate and sulphuric acid next to the heated wall of the retort would

obviously become dry first, and acquire a temperature sufficient to set up a reaction between the sulphuric acid and the carbonaceous substance. He therefore interrupted the distillation at this moment, and after well stirring the contents of the retort continued it again. By repeating this two or three times he succeeded in drawing over almost the whole of the acetic acid clear and colorless.

The product thus obtained, of course contained sulphurous acid, and traces of sulphuric acid, carried over mechanically. This objectionable circumstance cannot be altogether avoided, even when pure acetate is used; but both substances may be easily separated by the addition of a little peroxide of manganese or lead, together with a simple redistillation.

The form of apparatus afterwards employed by the author was a basin-shaped vessel of cast-iron, with a broad flat rim, upon which fitted a flat lid, with a copper dome in the centre, capable of being cooled by a stream of water. The iron lid may be removed at intervals, when the distillation is interrupted for the purpose of stirring the contents with shovels. He has thus been able to prepare about a hundred-weight of pure concentrated acetic acid daily.—*London Pharm. Journ.*, March, 1854, from *Jahrbuch der K. K. geologischen Reichsanstalt*, Jahrg. iii., No. 2.

ON THE SACCHARATED ALCOHOLIC EXTRACT OF IPECACUANHA.

By A. G. DUNN, late Apothecary to Kings County Hospital, L. I.

The *Cephælis ipecacuanha*, being a most efficient remedial agent, and at the same time a very safe and mild one, has been and is still most extensively used; but, owing to numerous adulterations, the dose is rendered quite uncertain, whether given in pill, powder, or otherwise. The tincture, wine and syrup, are likewise of unequal strength, being made after many different formulæ. The chief objection to the powder, however, is its absolute insolubility, thereby causing an unpleasant mixture when prescribed with liquids.

Taking into consideration these facts, and from reading in the *American Journal of Medical Sciences*, No. xlv. p. 229, an article on various saccharine forms of medicines, we were led to at-

tempt the preparation of a *saccharated alcoholic extract of ipecacuanha*, which should be of uniform strength, perfectly soluble and also agreeable to take. The following is the formula: R. Rad. ipecac. $\mathfrak{Z}\text{iv.}$, bruise to a coarse powder, and macerate for thirty days in $\mathfrak{f}\mathfrak{z}\text{xvi.}$ of diluted alcohol, shaking it occasionally, then filter and express. The tincture thus formed is to be evaporated to $\mathfrak{Z}\text{ij.}$ with which mix sacch. albi $\mathfrak{Z}\text{viij.}$, then triturate in a stone mortar until it is entirely dry.

The extract, as above prepared, has the peculiar odor and taste of ipecac.; it is of a brownish-yellow color, and is soluble in water, alcohol, ether, mucilage of acaciæ, &c.; in fact, in all the solutions with which ipecac. is usually combined. The dose required to be exhibited is the same as of the genuine powdered root.

From the more agreeable taste of this article, and its complete solubility in fluids, those physicians who have tried it have given it the decided preference over every other preparation of this valuable drug; and more especially in prescribing for children, for whom its sweet taste adapts it, as an excellent form for combination with other remedies, to be given in powders.

The success attending the administration of this extract, by the physicians of Kings County Hospital (in which institution it was first prepared and brought into notice), and others of the same profession in various parts of the said county, has induced us to publish this paper, in order that physicians generally may have an opportunity of testing its great superiority over the common forms of ipecac. at present in use.—*New York Journ. of Medicine*, March, 1854.

EXAMINATION OF BASSORAH GALLS.

By DR. L. F. BLEY.

The author has examined the so-called Bassorah galls. They were treated consecutively with alcoholic ether, cold water and hot water.

The galls lost 12 per cent. of water in drying. The alcoholic ethereal extract left a residue equal to 17 per cent. on the weight of the galls, of which water dissolved 14 per cent. The portion which was not soluble in water was shaken in ether,

which took up 3 parts of a yellowish fatty oil of a mild taste. The portion insoluble in ether was a brown solid resin; it had a shining appearance, was hard and brittle, burnt when heated over flame, fused, and left a small residue of earthy ashes. The alcoholic solution gave a grayish-white flocculent precipitate with water; it dissolved in caustic alkalies with a fine red color, and in fatty ethereal oils. Concentrated sulphuric acid dissolved the resin, forming a reddish-brown fluid. Nitric acid gave a yellowish solution. The portion of the galls not taken up by ether was exhausted with alcohol, the alcohol distilled off, and the residue treated with water, by which 5 parts of the resin above mentioned were separated. The tannic acid and 8 parts of gallic acid were obtained; these were determined by their behaviour with salts of oxide of iron.

Adding the constituents contained in the watery extracts, the Bassorah galls consist of—

Tannic acid	. . . . .	130	parts
Gallic acid	. . . . .	8	"
Fatty Oil	. . . . .	3	"
Resin	. . . . .	17	"
Extractive with salts	. . . . .	10	"
Linen-starch with small portions of common starch and albumen	} }	42	"
Fibrine	. . . . .	230	"
Water	. . . . .	60	"

500 parts.

Chem. Gaz. Dec. 15, 1854, from Archiv der Pharm. lxxv.

ON THE ACTION OF CARBONIC ACID UPON QUININE AND CINCHONINE AND ON THE FORMATION OF CRYSTALIZED CARBONATE OF QUININE.

By M. LANGLOIS.

A stream of carbonic acid gas was passed through newly precipitated quinine and cinchonine suspended in water. The prolonged action of the gas causes the quinine and cinchonine to dissolve; the former dissolves more readily than the latter. Both solutions, when exposed to the air, lose a portion of their carbonic acid, the one furnishing crystals of carbonate of quinine,

the other merely cinchonine. Crystallized carbonate of quinine is very readily obtained in this manner by the following process:

10 grms. of sulphate of quinine are dissolved in distilled water, to which a few drops of sulphuric acid have been added. The addition of ammonia to the solution precipitates the quinine, which is collected on a filter and washed, and then diffused, whilst still moist, through a litre of water. The milky fluid is put into a glass vessel, into which well-washed carbonic acid gas, produced by the action of muriatic acid upon marble, is passed. The quinine is entirely dissolved in less than an hour. The solution, although supersaturated with acid, retains an alkaline reaction.

Quinine combines directly with carbonic acid without dissolving, when it is not suspended in a sufficient quantity of water. By the process just described, a perfectly limpid solution is obtained, from which, after a short exposure to the air, crystals of carbonate of quinine are deposited; these continue increasing in size for twenty or twenty-four hours. After this no more is deposited, although the liquid still contains the salt. Spontaneous evaporation only furnishes quinine, which is also instantly precipitated by ammonia, potash and soda. Lime-water produces the same effect, with formation of a deposit of carbonate of lime.

The solution of carbonate of quinine consequently furnishes at first crystals of the saline compound, whilst afterwards this compound is destroyed, giving rise to carbonic acid and quinine. There is a complete analogy between these phenomena and those presented by a solution of carbonate and cinchonine. The latter never furnishes crystals, because the salt is present in very small quantity; this no doubt depends on the solubility of cinchonine in water being very little increased by the intervention of carbonic acid.

Carbonate of quinine forms transparent acicular crystals which soon effloresce when exposed to the air; they are soluble in alcohol, but insoluble in ether; they render reddened litmus-paper blue. With acids they produce a brisk effervescence.

At a temperature of 230° F. they are decomposed; carbonic acid is evolved, and the quinine remains without alteration. It only fuses at 338° F. The decomposition of carbonate of qui-

nine at so low a temperature furnishes a ready means for its analysis in the following manner:—A glass tube, 12 or 15 centims. in length, and closed at one end, was weighed, and 0.399 grm. of carbonate of quinine introduced into it. It was then connected, by means of a cork covered with india-rubber, with a bent tube, which passed under a graduated bell-glass placed over some mercury in a test-glass. The extremity of the tube passed the surface of the metal, so as to reach into the empty part of the bell-glass intended for the reception of the carbonic acid gas. The closed tube containing the salt was then heated in the oil-bath to about 230° F. Just before this temperature is reached, the carbonate of quinine is decomposed, the carbonic acid being driven off without any sensible change being produced in the physical characters of the salt.

The 339 milligrms. of the salt employed in this experiment furnished 21.36 cub. centims. of carbonic acid gas at 32° F., and a pressure of 76 centims. This volume of gas weighs 0.0422 grm. The evolution of gas ceases long before the oil-bath reaches the temperature of 338° F., at which the quinine fuses and entirely loses its water. The moisture which adheres to the side of the tube is readily removed by means of a few pieces of blotting-paper. The weight of the quinine, obtained by weighing the tube after the experiment and deducting the weight of the empty tube, was 321 milligrms. 0.399 grm. of carbonate of quinine consequently furnished—

	Grm.	per cent.	
		Found.	Calculated.
Quinine	0.3210	80.45	80.21
Carbonic acid	0.0422	10.58	10.88
Water	0.0358	8.97	8.91

These numbers lead to the formula ($C^{20}H^{12}NO^2, HO$) CO^2 HO for this salt. Six successive experiments on different quantities of the salt all led to the same results. As it must be regarded as neutral, we thus, in ascertaining its composition, fix the equivalent of quinine, which in this case agrees with that admitted by Leibig.

This decomposition of carbonate of quinine at a low temperature has also shown that this salt is not formed by double decomposition when a saline solution of quinine is treated with a solution of carbonate of potash or soda. The precipitate formed

consists only of quinine, which always retains a larger or smaller quantity of the carbonate employed, in spite of repeated washing. It is to the presence of this that the precipitate owes its property of effervescing with acids; but when fused in a glass tube, it does not furnish the least trace of carbonic acid. The same applies also to cinchonine, and perhaps even to all the vegetable bases.—*Ibid*, from *Comptes Rendus*, Nov. 7, 1858, p. 727.

ON THE VENOM OF SERPENTS.

By J. GILMAN, A. M., M. D., LL. D.

There is much in the history and habits of the reptile tribes, however repulsive they may be in appearance, that is very interesting. During a sojourn of two or three months in the interior of Arkansas, which appears to me to be the paradise of reptiles, I paid some attention to that branch of natural history called ophiology. I found four distinct varieties of rattlesnakes (*Crotalus*), of which the *Crotalus Horridus* and *Crotalus Kirtlandii* are by far the most numerous. The former is the largest serpent in North America. The family of moccasin snakes (*Coluber*) is also quite numerous, there being not less than ten varieties, most of which are quite as venomous as the rattlesnake. By dissecting great numbers of different species I learned that the anatomical structure of the poisoning apparatus is similar in all the different varieties of venomous serpents. It consists of a strong frame-work of bone, with its appropriate muscles in the upper part of the head, resembling and being in fact a pair of jaws, but externally to the jaws proper, and much stronger. To these is attached by a ginglymoid articulation, one or more moveable fangs on each side, just at the verge of the mouth, capable of being erected at pleasure. These fangs are very hard and sharp and crooked, like the claws of a cat, and hooked backwards, with a hollow from the base to near the point. I have occasionally seen a thin slit of bone divide this hollow, making two. At their base is found a small sac, containing two or three drops of venom which resembles thin honey. The sac is so connected with the cavity of the fang during its erection, that a slight upward pressure forces the venom into the fang at its base, and it makes its exit at a small slit or opening near the point, with considerable force; thus it is carried to the bottom

of any wound made by the fang. Unless the fangs are erected for battle, they lie concealed in the upper part of the mouth, sunk between the external and internal jaw bones, somewhat like a pen-knife blade shut up in its handle, where they are covered by a fold of membrane, which encloses them like a sheath; this is the *vagina dentis*. There can be no doubt but these fangs are frequently broken off or shed, as the head grows broader, to make room for new ones nearer the verge of the mouth; for, within the *vagina dentis* of a very large *crotalus horridus*, I found no less than five fangs on each side—in all stages of formation—the smallest in a half pulpy or cartilaginous state, the next something harder, the third still more perfect, and so on to the main, well-set, perfect fang. Each of these teeth had a well defined cavity like the main one. Three fangs on each side were frequently found in copper-heads, vipers, and others.

The process of robbing serpents of their venom is easily accomplished by the aid of chloroform, a few drops of which stupifies them. If, while they are under its influence, they are carefully seized by the neck, and the *vagina dentis* held out of the way by an assistant, with a pair of forceps, and the fang be erected and gently pressed upwards, the venom will be seen issuing from the fang, and dropping from its point. It may then be absorbed by a bit of sponge, or caught in a vial, or on the point of a lancet. After robbing several serpents in this manner, they were found after two days to be as highly charged as ever with venom of equal intensity with that first taken.

During the process of robbing several species of serpents, I inoculated several small but vigorous and perfectly healthy vegetables, with the point of a lancet well charged with venom. The next day they were withered and dead, looking as though they had been scathed with lightning. In attempting to preserve a few drops of venom, for future experiments, in a small vial with two or three parts of alcohol, it was found in a short time to have lost its venomous properties. But after mixing the venom with aqua ammonia, or spirits turpentine, or oil of peppermint, or of cinnamon, or of cloves, or with nitric or sulphuric acid, it still seemed to act with undiminished energy. It is best preserved, however, for future use by trituration with refined sugar or sugar of milk.

A very fine large cotton-mouth snake, being captured by put-

ting a shoe-string around him, became excessively ferocious, striking at even the crack of a small riding-whip. Finding himself a prisoner, without hope of escape, he turned his deadly weapons on his own body, striking repeatedly his well-charged fangs deeply into his flesh. Notwithstanding this, he was put in a small basket, and carried forward. In one hour after, he was found dead, and no amount of irritation could excite the least indication of life. Four hours after, while removing the skin for preservation, the blood oozed slowly from the vessels in a dissolved state. No violence was done to his snakeship, except what he did to himself.

Another moccasin, shot by a pistol about two inches back of the head, and skinned immediately, gave decided evidence of vitality four hours after being flayed, by wreathing the body whenever it was irritated by a scalpel.

A large rattle-snake beheaded instantly, with a hoe, would, an hour and a half after, strike at any thing that pinched its tail. Of several persons who were testing their firmness of nerve, by trying to hold the hand steady while the serpent struck at it, not one could be found whose hand would not recoil in spite of his resolution, and one man, a great bully, by-the-by, was struck on the naked throat with considerable violence by the headless trunk of the serpent, and staggered back, fainted and fell, from terror. Mr. Stewart, of Miss., tells me he witnessed a similar scene once. An old hunter shot a rattle snake's head off, and after reloading his gun and standing some time, he stooped to pull off the rattles, and the bloody but headless trunk of the snake struck him in the temple and he fainted and fell down with terror.

Seven venomous serpents belonging to five different species were made to fraternize and dwell amicably in one den. A beautiful pair of long bodied speckled snakes, known as king-snakes, and found to be fangless, and consequently without venom, were duly installed as members of the family. Some uneasiness was perceivable among the older members, but no attempt was made to destroy the intruders, though they might have been killed instantaneously. The next morning four of the venomous serpents were found to have been destroyed by the king-snakes, and one was still within their coil, and the two remaining ones would make no effort at self-defence. A large rattle-snake seemed stupid and indifferent to his fate. He could not be made to threaten or

give warning even with his rattle. The smallest king-snake was afterwards inoculated with the poison of one of the serpents he had destroyed, and died immediately after—thus evincing that they must have exercised some power besides physical force to overcome their fellow-creatures.

In short, the results of a great number of experiments performed with the venom of a great variety of serpents, seem to lead to the following conclusions :

1st. That the venom of all serpents acts as a poison in a similar manner.

2d. That the venom of some varieties is far more active than that of others.

3d. That a variety of the colluber, known as the cotton-mouth, is the most venomous serpent in Arkansas.

4th. That the venom of serpents destroys all forms of organized life, vegetable as well as animal.

5th. That alcohol, if brought in contact with the venom is, to a certain extent, an antidote.

6th. That serpents do possess the power of fascinating small animals, and that this power is identical with mesmerism.

7th. That the blood of small animals, destroyed by the venom of serpents, bears a close resemblance to that of animals destroyed by lightning or hydrocyanic acid; it loses its power of coagulation and cannot be long kept from putrefaction.—*St. Louis Med. and Surg. Jour.*, Jan. 1854.

SYRUP OF ELDERBERRIES (*SAMBUCUS CANADENSIS*) AS A SUBSTITUTE FOR THE COMPOUND SYRUP OF SARSAPARILLA.

By WILLIAM H. WORTHINGTON, M.D., of West Chester, Pa.

There being much dissatisfaction attending the use of the Compound Syrup of Sarsaparilla in the hands of some physicians, the Syrup of Elderberries was recommended to my notice by Dr. Benjamin H. Stratton, of Mount Holly, N. J., who for some years has been in the habit of using it in all cases of disease, in which an alterative action upon the system was desired, and for which the sarsaparilla is usually employed. In the treatment of gout, chronic rheumatism, eruptive and syphilitic affections, he has used it combined with the iodide of potas-

sium, with marked benefit. The formula used by him is the following:—

R.	Juice of Elderberries,	. . .	Oxvj.
	Sugar Crystal,	. . .	lbxvj.

Mix and boil to a syrup; after allowing it to cool, add to every pint of syrup one ounce of the best fourth proof French brandy, bottling and keeping in a cool place.

Dose, from a dessert to a table spoonful three times a day.

Flattering myself that an improvement could be made in the preparation of the above syrup without injury, I have prepared a compound syrup of elderberries, containing some, if not all of the most active ingredients of the compound syrup of sarsaparilla, (*Guaiaci lignum* and *Sennæ fol.*;) by this means, as I think, increasing the alterative virtues of the syrup, giving it a more marked and active character in the treatment of gout, rheumatism, &c., than it possessed without them. To this syrup may be added the iodide of potassium to suit the views of those prescribing. The formula is as follows:—

R.	Juice of Elderberries,	. . .	Oxvj.
	Sugar Crystal,	. . .	lb.xvj.
	Guaiacum wood,	. . .	℥iv.
	Senna leaves,	. . .	℥iii.

Put the sennæ fol. and the guaiac. lig. in three pints of water, boiling it down one-half, and strain. Put the juice and sugar in a kettle, place it on the fire, and when it has come to a boil, add the decoction of guaiac. lig. and sennæ fol., allow it to boil to a syrup, when it must be taken off strained and let cool. To every pint of syrup add one ounce of the best fourth proof French brandy, bottling and keeping in a cool place.

Dose, the same as preceding.

The syrup of elderberries is given to the profession chiefly upon the recommendation of Dr. Stratton, whose skill and experience as a practitioner is entitled to the confidence of his medical brethren. If, as he believes, it possesses more certain and prompt remedial virtues as an alterative than sarsaparilla, it ought to be added to our catalogue of officinal articles. The difficulty of obtaining at all times good sarsaparilla, and especially in the country, increases the claims of this syrup upon our rural practitioners, who can command with facility, and in great abundance, the material for its preparation.—*Medical Reporter.*

FORMULA FOR STYPTIC BALSAM.

By JAMES WARREN, M. D.

It is nearly thirty years since I commenced the use of this balsam as a styptic, in the various forms of hemorrhage which are within the domain of medical pathology, and with uniform success. I am satisfied that no remedy now known exerts a more specific power and more speedy relief, especially in hemoptisis, hematemesis, epistaxis, and menorrhagia. It acts both by its sedative power, in diminishing the force of the circulation, and by its astringent qualities, in contact with the bleeding vessels. In the treatment of hemorrhage, neither bloodletting, confinement to the room, suppression of the voice, relaxation from business, nor other precautions are necessary; nor is any auxiliary treatment required, except, perhaps, a dose of Epsom salts, where there is evidence that blood has been swallowed.

Ordinary exercise in the open air is decidedly preferable to inaction; and wherever there are premonitory symptoms of a return of hemorrhage, it has always exerted a prophylactic power when promptly used; and by this early resort to the remedy, many radical cures have been effected.

The following is the formula and the method of using it:—

B. Acid. Sulphuric. (by weight,) 3v.

Spts. Terebinth.

Spts. Vin. Rect. aa.

} f 3ij.

Place the acid in a Wedgewood mortar, and add the turpentine slowly, stirring it constantly with the pestle; then add the alcohol in the same manner, and continue stirring it until no more fumes arise, when it may be bottled, and should be stopped with a ground stopper. It should be prepared from the purest materials; and when done, it should exhibit a dark but clear red color, like dark blood; but if it be a pale, dirty red, it will be unfit for use. The dose is 40 drops, and the method of using it is as follows: Put a teaspoonful of brown sugar in a common-sized teacup, and rub in 40 drops of the balsam until it is thoroughly incorporated, and then slowly stir in water until the cup is nearly full, when it should be immediately swallowed. This dose may be repeated at intervals of an hour, until three or four doses are taken, if necessary; and its use should be discontinued

when fresh blood ceases to flow. After standing a few days, a pellicle forms upon the surface of the balsam, which should be broken, and the liquid below it used. It does not deteriorate by age, if tightly stopped.—*N. Y. Journal of Medicine*, from *N. Y. Med. Times*.

NOTICE OF THE "CALIFORNIA NUTMEG."

By PROFESSOR J. TORREY, M.D.

About a year ago, I received from the late Mr. Shelton, who had just returned from San Francisco, a specimen of what was called the *California nutmeg*. I immediately considered it a species of Arnott's genus *Torreya*, belonging to the order *Taxineæ* of the great natural family of *Coniferae*. It had been discovered but a year or two before Mr. Shelton left the country, and had already attracted considerable attention, not only from the beauty of the tree, but from the singular character of the fruit and kernel, the latter strongly resembling the common nutmeg. Indeed, it has been frequently stated in letters from California, that the nutmeg is a native of that country. The foliage has the form and deep rich green of the Florida species, or *T. taxifolia*, as well as of the yew; but the leaves are much larger, being from an inch and a half to two and a quarter inches long. They spread out on two sides, and are tipped with a sharp, rigid point. The fruit, as it may be popularly called, is about the size and form of a green gage plum, and in the dried state is of a pale olive color, but this may not be its natural tint. The outer covering is a thick, fleshy, nearly closed urceole, or dish, which completely invests the seed and closely adheres to it, except near the summit. It is smooth and even, and soft to the touch. The seed is usually oblong, and greatly resembles a large pecan nut, but frequently is more ovate. The shell is smooth, thin, and fragile. On each side, near the summit and just below the non-adhering portion of the dish, is a perforation, communicating with an interior canal, similar to what I described in *T. taxifolia*, and the use of which is still unknown. The kernel is conformed to the shell, and has the external and internal appearance of the nutmeg. When cut transversely the resemblance is perfect. The seed, however, is wholly destitute of

the delicate aromatic odor of the oriental spice, for it has the strong terebinthine character of the Coniferae. Neither is the fleshy covering of any known use. It is more probable that, like the fleshy cup-a-berry of the yew, it is of a poisonous nature. Still the discovery of this tree is interesting to the botanist and to the horticulturist. But two other species are known besides. One of them (*T. nucifera* Sieb. and Zucc.) is a native of Japan, and the other has only been found hitherto in Middle Florida, in very confined stations. The latter is erroneously stated by Zuccarini to have a seed as large as a walnut, by which he undoubtedly means the *Juglans regia*, or Madeira-nut, as it is called in the United States.

As an ornamental tree, the California nutmeg deserves to be extensively cultivated. It must be hardy, as it grows on the mountains, where the winter is very severe.

The enterprising Messrs. Parsons and Co., of Flushing, sent out a person to California for the express purpose of collecting the ornamental and useful plants of that country, and among other varieties, he obtained, last year, some ripe and fresh seeds of the Californian nutmeg. These germinated freely, and, when I saw the young plants last October, they had a healthy appearance, and had attained a good size. I have lately heard, also, that Mr. Lobb, an English collector, who has been exploring California for several years past, has sent seeds of this tree to England.

I close this notice with a short technical description of the new *Torreya*, which may be called *T. Californica*.

T. foliis distichis, brevissime petiolatis, cuspidatis pungentibus subconcoloribus; floribus foemineis solitariis sessilibus; semilibus oblongis, disco carnosus clauso.

Hab. Upper part of the Yuba and Feather Rivers, on the western slope of the Sierra Nevada of California.

Differs from *T. taxifolia* in the leaves being much larger, and not glaucous underneath, as well as being furnished with a sharper and more rigid point. The seed is longer, and the fleshy covering much thicker.

96 St. Mark's Place, February 3d, 1854.

[*N. Y. Jour. of Pharm.*, Feb., 1854.]

ON THE DRIED COFFEE-LEAF OF SUMATRA.

Which is employed in that and some of the adjacent Islands as a substitute for Tea or for the Coffee-bean.

By JOHN STENHOUSE, LL. D., F. R. S.

I recently received from my friend Daniel Hanbury, Esq., a quantity of dried coffee-leaves, which had been prepared in Sumatra, under the direction of N. M. Ward, Esq., of Padang.* The sample had a deep brown color, and consisted of the leaves of the coffee-tree mixed with fragments of the stalks. The leaves had been very strongly roasted in rather a rough manner, and had consequently acquired a slightly empyreumatic odor. In this respect they pretty closely resemble Paraguay tea, the leaves and twigs of the *Ilex paraguayensis*, which is subjected to a somewhat similar process. The coffee-leaves, when digested with boiling water, yielded a deep brown infusion, which in taste and odor closely resembled an infusion of a mixture of coffee and tea. On the addition of milk and sugar, it formed a very tolerable beverage; and as the roasted coffee-leaf can be imported into Europe for rather less than twopence per pound, the poorer classes are likely to find it a very useful substitute for tea and coffee. Should a more moderate temperature be employed in drying the coffee-leaf, I think its flavor would be greatly improved.

The coffee-leaf, as might almost have been expected, contains the two characteristic constituents of the coffee-bean, viz., theine or caffeine, and caffeic acid. In this respect the coffee-leaf differs essentially from chicory or any of its adulterations, such as roasted turnips, mangelwurzel, carrots, &c., the usual substitutes for coffee, which do not contain a trace of either of these principles.

The theine or caffeine was extracted from the coffee-leaves in the usual way, by precipitating the coloring matter and other impurities, first by acetate and then by subacetate of lead. The acetate of lead threw down a dark brown precipitate containing all the caffeic acid, and the subacetate produced a scanty bright yellow precipitate. The excess of lead was then removed from the clear solution by sulphuretted hydrogen, and the sulphide of

* See Vol. XXV, page 221 of this Journal.

lead having been collected by filtration, the theine crystallized when the liquid, after being sufficiently concentrated, had been set aside in a cool place for some days.

The crystals of theine as first obtained were of a brownish color, but after being strongly pressed between folds of blotting-paper and repeatedly crystallized, they were rendered nearly colorless.

I. 1000 grains of dried coffee-leaves, when treated in the way just described, yielded 12.5 grains theine = 1.25 per cent.

II. 1000 grains of coffee-leaves in a subsequent trial, gave 11.54 grains = 1.15 per cent.

The amount of nitrogen in the dried coffee-leaves was also determined by Will's method.

1.344 grm. substance gave 0.2005 platinum = 2.118 per cent. nitrogen.

0.7775 grm. gave 0.1185 platinum = 2.165 per cent.

Now it has been ascertained as the result of numerous experiments,* that "coffee contains from 0.80 to 1 per cent. of theine, and that tea contains 1 per cent. of the same principle." "And the nitrogen in coffee-beans (see page 27 of the same Report) lies between $2\frac{1}{2}$ and 3 per cent."

By a recent determination I found that 1000 grains of a good black tea gave 21.3 grains of theine = 2.13 per cent.

1000 grains of a black tea grown in the East India Company's tea plantations at Kemaon, on the Himalayas, gave 19.7 grains = 1.97 per cent.

0.4705 grm. of the same Kemaon tea gave 0.1175 platinum = 3.5 per cent. nitrogen.

Many years ago I detected the existence of theine in what is called Paraguay tea, the dried leaves and twigs of the *Ilex paraguayensis*, but I neglected to determine its amount. I have recently found that 1000 grains of Paraguay tea yielded 12.3 grains of theine = 1.23 per cent.

III. 1000 grains ditto gave 11 grains = 1.1 per cent.

1.748 grm. gave 0.1865 platinum = 1.51 nitrogen.

* See the 32nd page of the "Chemical Report on the Mode of Detecting Vegetable Substances mixed with Coffee, for the purposes of adulteration," drawn up by Professor Graham, Dugald Campbell, Esq., and myself, for the British Government, and communicated to it in December, 1852.

1.031 grm. gave 0.153 platinum = 1.70 nitrogen per cent.

From these results it is clear that dried coffee-leaves are somewhat richer in theine than the coffee-bean, and contain, as nearly as may be, the same amount of that principle as Paraguay tea.

From the violent roasting to which the coffee-leaves had been subjected, I feel convinced a portion of their theine has been dissipated; and were they only dried at a moderate temperature, I confidently expect that they would yield $1\frac{1}{2}$ per cent. of theine. The theine obtained from the coffee-leaves was not subjected to analysis. This I considered unnecessary, as it possessed all the well-known properties of ordinary theine, crystallizing in fine silky crystals, which readily sublimed when heated; and when digested with nitric acid and cautiously evaporated to dryness, they gave when treated with ammonia the characteristic red coloration so closely resembling that from uric acid when acted on by the same reagents.

With regard to caffeic acid, the other characteristic proximate principle of coffee, the leaf of the coffee plant contains it also in larger quantity than the berry. Caffeic acid is precipitated of a deep yellow color by acetate of lead, but is apparently uncrystallizable; at least the numerous attempts which I have made to obtain it in a crystallizable state have hitherto proved unsuccessful. Caffeic acid does not precipitate solutions of gelatine, and it is therefore not a species of tannin, as has been sometimes asserted. The most remarkable property of caffeic acid is that first stated at the 34th page of the joint Report on the adulteration of coffee already quoted. "Caffeic acid appears to be analogous to kinic acid, the acid of cinchona barks, for it yields kinone when oxidated by means of sulphuric acid and binoxide of manganese. To observe this properly, the coffee is boiled with water and a little slaked lime, the infusion filtered and evaporated down to the consistence of a syrup. The syrupy liquid is then mixed in a retort with four times its weight of binoxide of manganese, and one part of oil of vitriol diluted with an equal bulk of water. Sufficient heat is produced by the action of the sulphuric acid upon the other materials to bring over the greater portion of the kinone, and the lamp need not be applied till towards the close of the operation. The distillate consists of yellow crystals of kinone, which usually coat the neck and sides of the retort, and a bright yellow liquid, which is a saturated aqueous solution of kinone,

with a considerable quantity of formic acid. Kinone is easily discernible by its volatility and peculiarly acrid odor, which greatly resembles that of chlorine. The solution of kinone gives with ammonia a sepia black color. It is decolorized by sulphurous acid. The beautiful green hydrokinone is obtained by exactly neutralizing the solution of the yellow kinone with sulphurous acid, great care being taken not to introduce the latter in excess.

"The peculiar acid in Paraguay tea agrees with caffeic acid, to which it is no doubt related, in yielding kinone to similar oxidizing agencies; so does the acid of the leaves of the common holly, *Ilex aquifolium*, and the whole of the cinchona tribe."

When coffee-leaves are boiled with a considerable quantity of water, and a slight excess of milk of lime, the dark brown strongly alkaline liquor is cautiously evaporated to dryness, and then treated in the way already described, with three times its weight of black oxide of manganese and one part of sulphuric acid, diluted with its own bulk of water, a much larger quantity of crystals of kinone are obtained than can be procured from an equal weight of the coffee-bean. This clearly shows that the leaves are richer in caffeic acid than the beans.

Kinone may, I find, be obtained in small quantity by a similar process from a great number of our commonest plants. Thus I also obtained indications of kinone from the leaves and branches of the privet, *Ligustrum vulgare*; from the common ivy, *Hedera helix*, from the *Quercus Ilex*, the evergreen oak of our gardens and shrubberies, a native of Turkey; from the *Quercus robur*, the common British oak; from the *Ulmus campestris*, the common small-leaved elm; from the ash, *Fraxinus excelsior*; and from the bush-tea of the Cape of Good Hope, the *Cyclopia latifolia* of De Candolle, a plant of the natural order Leguminosæ.

From numerous plants which I tried, I could not obtain a trace of kinone. This was the case among others with laburnum, *Cytisus laburnum*, with tobacco, with *Prunus spinosa*, the sloe, and others too numerous to mention.

The kinone was only obtained in crystals from the coffee-bean, from the coffee-leaf, and from the holly, *Ilex aquifolium*. In all the other cases, its existence was detected by the deep yellow liquid which distilled over at a comparatively low temperature, and which yielded the dark humus-like coloration with ammonia,

so characteristic of solutions of kinone. Kinone is so exceedingly soluble in water, that unless a considerable amount of it is evolved, and proper precautions are employed, a deep-colored solution of it only is obtained, either from the coffee-leaf, the berry or the leaves of the holly. The comparatively small amount of the kinone yielding substance, or perhaps we should say substances, present in such plants as the privet, the oak, &c., is most probably the only reason why crystals of kinone have not likewise been obtained from these plants.

In order to assist in forming an estimate of the comparative value of coffee-leaves as a beverage as compared with the bean, I determined the amount of soluble matter which each of them yielded to boiling water. 6.048 grms. of dried coffee-leaves and 6.038 grms. of roasted and ground coffee-beans were repeatedly treated with precisely similar quantities of boiling water, till the liquid which came off from them was nearly colorless. The 6.048 grms. coffee-leaves were found to have lost 2.348 grms. = 38.8 per cent., while the 6.038 grms. roasted coffee-beans had lost 1.759 grms. = 29.1 per cent. From this determination it is clear that coffee-leaves yield to boiling water near 10 per cent. more soluble matter than the bean. In this respect, therefore, the coffee-leaf has an advantage over the berry.

So far as regards the two characteristic principles of coffee, viz., caffeic acid and theine or caffeine, these are common both to the leaf and to the bean, the leaf being decidedly rich in both. In other respects, however, they differ considerably. The coffee-leaf contains some tannin, and scarcely any sugar or fat. The coffee-bean contains about 12 per cent. of fat and "8 per cent. of cane-sugar." (See Joint Report.)

So far as I can judge, the infusion of the coffee-leaf has a much greater resemblance to that of tea than to a decoction of the coffee-bean; so that should the coffee-leaf ever come into general use in European countries, it will be rather as a substitute for tea than for coffee. If the coffee-leaves were only dried at a somewhat lower and better regulated temperature, I have little doubt that they would yield a much more agreeable beverage than can be made with the present roughly-roasted and partially empyreumatized product.—*Lond. Pharm. Jour. Feb. 1854, from Philosophical Magazine.*

THE USE OF COFFEE AS A BEVERAGE CONSIDERED IN A
CHEMICAL AND PHYSIOLOGICAL POINT OF VIEW.

By PROFESSOR LEHMANN.

In the experimental consideration of this subject the author has adopted as a principle, that under a well regulated and uniform diet and mode of life, the quantitative relations of the substances excreted in the urine, present a trustworthy view of the general assimilative process in the individual.

He has therefore selected patients whom he considered fit, and while administering to them either coffee or its various constituents separately, has made such regular observations of the urinal excretions as would enable him to infer what is the nature of the efficacy of coffee and of its constituents respectively.

In determining the amount of urea, he has adopted the method recently put forward by Liebig.

The general results of his investigation are :

1. That a decoction of coffee exercises two principal actions upon the organism, which are very diverse in character, viz., increasing the activity of the vascular and nervous system, while at the same time it retards the metamorphosis of plastic constituents.

2. That the influence of coffee upon the vascular and nervous system, its re-invigorating action, and the production of a general sense of cheerfulness and animation is attributable solely to the mutual modification in the specific action of the empyreumatic oil and the caffeine contained in it.

3. That the retardation of the assimilative process brought about by the use of coffee, is owing chiefly to the empyreumatic oil, and is caused by caffeine only when taken in large quantity.

4. That increased action of the heart, trembling, headache, &c., are effects of the caffeine.

5. That the increased activity of the kidneys, relaxation of the bowels, and an increased vigor of mental faculties, passing into congestion, restlessness, and inability to sleep, are effects of the empyreumatic oil.

Professor Lehmann considers it therefore necessary to regard the action of coffee, and in a less degree that of tea, cocoa, alcohol, &c., upon the organism, as constituting an exception to the gen-

eral law, that increased bodily and mental activity involves increased consumption of plastic material.

He considers that these substances have the capability of rendering the individual insensible of a certain deficiency of food in virtue of their retardation of the assimilative process.

He thinks it probable, likewise, that these substances have a direct nutritive value, especially coffee as drank by the Turks and Arabs with the grounds.

He attributes the rapid increase in the consumption of coffee to an instinctive tendency to provide some remedy for the compulsory use of the potato as food among the lower classes; and in confirmation of this, points to the facts, that the introduction of the potato from the west, and that of coffee (as an article of food) from the east, were simultaneous, and that the increase in their consumption has progressed equally, both as regards amount and locality.

Professor Lehmann considers that the singular preference of one or other of these beverages by particular nations, as well as the eastern custom of drinking coffee with the grounds, are not accidental, but have some deeper reason. This reason he thinks is to be found in the different effects of the coffee, tea, &c., and the various requirements of the nations by whom they are used, and instances the use of tea by the English, and of coffee by the Germans and French, as in accordance with this view. The diet of the former affords a larger supply of plastic material than that of the latter people, and while, consequently, the retardation of the assimilative process is an important influence for the German, the proportionately greater nervous stimulus caused by tea is more desirable for the former.

The use of coffee with its grounds, has its analogue in the use of tea mixed with meal, milk, and butter among the Mongols, and other inhabitants of the central Asiatic steppes.—*London Pharm. Jour.*, Feb. 1854, from *Annalen der Chemie und Pharmacie*, September, 1853.

REMARKS ON SARSAPARILLA.

By DR. BERTHOLD SEEMAN.

At a meeting of the Linnean Society, held December 6th, a paper was read by Dr. Seeman on the above subject, of which the following abstract is given in the *Gardener's Chronicle*:—

“In this interesting memoir, Dr. Seeman stated, as the conclusions at which he had arrived, after a careful investigation of the subject, that the greater proportion of Sarsaparilla imported under the commercial names of ‘Jamaica,’ ‘Lisbon,’ or ‘Brazilian,’ and ‘Guatemala’ or ‘Red Paraguay’ Sarsaparilla, is the produce of one species only, and that the *Smilax officinalis* of Humboldt and Bonpland; and further that the *S. medica* of Schlechtendal and Chamisso, and the *S. papyracea* of Poiret, are identical with it. *Smilax officinalis* grows in the lower coast region as well as on the mountains to an elevation of 5000 feet above the sea, and is confined, as far as is known, to the South American continent between the 20th degree of N. lat. and the 6th degree of S. lat., and the 110th and 40th degrees of West longitude. The article known as Jamaica Sarsaparilla is imported into that island from the Spanish Main. The roots, which form the commercial article, abound more or less in starch, according to the age and conditions under which they have grown. The stem is quadrangular and prickly, the branches also quadrangular or multiangular, and with or without prickles, the petioles sheathing at the base, and having a pair of tendrils, the leaves very variable, broadly cordate, almost three-lobed, gradually acuminate or ovate-oblong, or even lanceolate, and rounded at the apex, but always mucronate, generally five-nerved, and prickly on the nerves beneath, varying in length from two inches to one foot, and in texture from coriaceous to papery; the flowers, which grow in little umbels of about sixteen together, are unknown, but the berries are round, red, and the size of a cherry. Dr. Seeman further remarks, that while botanists competent to judge of the question are not likely to raise any objection to his uniting these three supposed species, pharmacologists are less likely to be convinced on this point, except on the strongest evidence, the appearance of the commercial samples being so different; the Lisbon Sarsaparilla, which comes in rolls about three feet long, having fewer rootlets or beards than that termed Jamaica Sarsaparilla.

This difference, however, was stated to be clearly the result of the rootlets having been removed by some mechanical means or other, before the article reaches the market. The condition indicated by the chief pharmacological distinction into 'mealy' and 'non-mealy' samples, he believes to depend on the age of the roots, and on the locality in which they are collected. While, however, the botanical source of the various Sarsaparillas was thus held to be identical, the value of the commercial distinctions, as such, was admitted; for 'as long as the Brazilian collectors continue to strip the roots of their beard and put them up in long bundles, there will always be Lisbon Sarsaparilla; as long as the inhabitants of the Spanish Main continue to preserve the rootlets we shall have Jamaica Sarsaparilla; and as long as the climate and other physical conditions of Guatemala remain unchanged, we shall continue to receive from that locality Sarsaparilla distinguished by its abundance of starchy matter.'—*Lond. Pharm. Jour.*, Feb. 1854.

ON THE COLLECTION AND PREPARATION OF CAOUTCHOUC
IN BRAZIL.

The following account of the collection of Caoutchouc, which is called *Seringa*, and the collectors of it *Seringeros*, is taken from Herndon's Exploration of the Amazon.

"The owner of the house told me that the season for gathering the rubber or *Seringa*, as it is called here, was from July to January. The tree gives equally well at all times; but the work cannot be prosecuted when the river is full, as the whole country is then under water. Some, however, is made at this time, for I saw a quantity of it in this man's house, which was evidently freshly made.

The process of making it is as follows: a longitudinal gash is made in the bark of the tree with a very narrow hatchet or tomahawk; a wedge of wood is inserted to keep the gash open, and a small clay cup is stuck to the tree beneath the gash. The cups may be stuck as close together as possible around the tree. In four or five hours the milk has ceased to run, and each wound has given from three to five tablespoonfuls. The gatherer then collects it from the cups, takes it to his rancho, pours it into an earthen vessel, and commences the operation of forming it into

shapes and smoking it. This must be done at once, as the milk soon coagulates.

A fire is made on the ground of the seeds of nuts of a palm tree, of which there are two kinds; one called *Urucari*, the size of a pidgeon's egg, though longer; and the other *Inaja*, which is smaller. An earthen pot with the bottom knocked out, is placed, mouth down, over the fire, and a strong pungent smoke from the burning seed comes up through the aperture in the bottom of the inverted pot.

The maker of rubber now takes his last, if he is making shoes, or his mould, which is fastened to the end of a stick, pours the milk over it with a cup, and passes it slowly several times through the smoke till it is dry. Moulds are made either of clay or wood; if of wood, it is smeared with clay to prevent the adhesion of the milk. When the rubber has the required thickness, the moulds are either cut out or washed out. Smoking changes the color of the rubber very little. After it is prepared, it is nearly as white as milk, and gets its color from age.

The most common form of the India rubber of commerce is that of a thick bottle; though it is also frequently made in thick sheets, by pouring the milk over a wooden mould shaped like a spade, and when it has a coating sufficiently thick, passing a knife around three sides of it, and taking out the mould. I should think this the least troublesome form, and most convenient for transportation.

From 20 to 40 coats make a pair of shoes. The soles and heels are of course given more coats than the body of the shoe. The figures on the shoes are made by tracing them on the rubber whilst soft, with a coarse needle or a bit of wire. In a week the shoes are taken from the last. The coating occupies about 25 minutes. An industrious man is able to make about sixteen pounds of rubber a day; but the collectors are not industrious. I heard a gentleman in Para, say they rarely average more than three or four lbs.

The tree is tall, straight, and has a smooth bark. It sometimes reaches a diameter of eighteen inches or more. Each incision makes a rough wound on the tree, which, although it does not kill it, renders it useless, because a smooth place is required to attach the cups. The milk is white and tasteless, and may be taken into the stomach with impunity.

The rubber is frequently much adulterated by the addition of tapioca or sand, to increase its weight; and unless care is taken in its manufacture, it will have many cells containing air and water. Water is seen to exude from nearly all of it when cut, which is always done for the purpose of examination before purchase. I brought home some specimens, that were more than half mud." Pages 330 and 331.

IDENTITY OF DYNAMIC OR VOLTAIC ELECTRICITY WITH
STATIC OR FRICTIONAL ELECTRICITY.

By PROFESSOR FARADAY.*

The Friday evening meetings for the season commenced at the Royal Institution on Friday last, the opening lecture being delivered by Professor Faraday to a very crowded audience. The subject was the developement of electrical principles produced by the working of the electric telegraph. To illustrate the subject, there was an extensive apparatus of voltaic batteries, consisting of 450 pairs of plates, supplied by the Electric Telegraph Company, and eight miles of wire, covered with gutta percha, four miles of which in coils were immersed in tubs of water, to show the effects of submersion on the conducting properties of the wire in submarine operations. The principal point which Professor Faraday was anxious to illustrate, was the confirmation which experiments on the large scale of the electric telegraph have afforded of the *identity of dynamic or voltaic electricity with static or frictional electricity*. In the first place, however, he exemplified the distinction between conductors and non-conductors, impressing strongly on the audience that no known substance is either a perfect conductor of electricity or a perfect non-conductor, the most perfect known insulator transmitting some portion of the electric fluid, whilst metals, the best conductors, offer considerable resistance to its transmission. Thus the copper wire of the submarine electric telegraph, though covered with a thickness of gutta percha double the diameter of the wire, permit an appreciable quantity of the electricity transmitted to escape through the water; but the insulation is, nevertheless, so good.

* From the London Mechanics' Magazine, January 7.

that the wire retains a charge for more than half an hour after connexion with the voltaic battery has been broken. Professor Faraday stated that he had witnessed this effect at the Gutta Percha Works, where one hundred miles of wire were immersed in the canal. After communication with a voltaic battery of great intensity, the wire became charged with electricity, *in the same manner as a Leyden jar*, and he received a succession of forty small shocks from the wire, after it had been charged and the connexion with the battery broken. No such effect takes place when the coils of wire are suspended in the air, because in the latter case there is no external conducting substance. The storing-up of the electricity in the wire when immersed in water is exactly similar to the retention of electricity in a Leyden jar, and the phenomena exhibited correspond exactly with those of static electricity, proved in this manner, as had previously been proved by charging a Leyden jar with a voltaic battery, that dynamic and static electricity are only different conditions of the same force; one being great in quantity, but of low intensity, whilst the latter is small in quantity, but of great intensity. Some interesting facts connected with the conduction of electricity have also been disclosed by the working of the submarine telegraph, which Professor Faraday said confirmed the opinion he had expressed twenty years ago, that the conducting power of bodies varies under different circumstances. In the original experiments by Professor Wheatstone, to ascertain the rapidity with which electricity is transmitted along copper wire, it was found that an electric spark passed through a space of 280,000 miles in a second. Subsequent experiments with telegraph wires have given different results, not arising from inaccuracy in the experiments, but from conditions of the conducting wires. It has been determined that the velocity of transmission through iron wire is 16,000 miles in a second, whilst it does not exceed 2700 miles in the same space of time in the telegraph wire between London and Brussels, a great portion of which is submerged in the German Ocean. The retardation of the force in its passage through insulated wire immersed in water is calculated to have an important practical bearing in effecting a telegraphic communication with America; for it was stated that, in a length of 2000 miles, three or more waves of electric force might be transmitting at the same time, and that if the current be reversed, a signal sent

through the wire might be recalled before it arrived at America. Professor Faraday concluded by exhibiting a beautiful experiment illustrative of the identity of voltaic and frictional electricity. The terminal wires of a powerful secondary-coil apparatus were placed seven inches apart within the receiver of an air pump, and when the receiver was exhausted, a stream of purple colored light passed between the wires, resembling, though more continuous and brilliant, the imitation of the aurora borealis produced when an electric spark is passed through an exhausted glass tube. The voltaic power employed to produce this effect of static electricity was only three cells of a Grove's battery.—*Frank. Inst. Jour.* April, 1854.

RESEARCHES ON EVAPORATION.

By PROFESSOR MARCET, of Geneva.

The following experiments were instituted with the view of throwing some light on the tendency of certain circumstances to promote or diminish the evaporation of liquids. Water and alcohol were the liquids chiefly used. The results obtained by the author may be recapitulated as follows:—

1. The temperature of a liquid, allowed to evaporate freely in an open vessel, is always inferior to that of the surrounding atmosphere. The higher the temperature of the atmosphere, the greater is the difference between its temperature and that of the liquid exposed to evaporation. Between 40° and 50° Centigrade, the difference was found to vary from 5° to 7° ; between 20° and 25° it varied from $1\frac{1}{2}^{\circ}$ to $1\frac{1}{4}^{\circ}$; at 12° it was 0.8° only, and between 3° and zero about 0.2° . The explanation of this result is obvious. The evaporation of a liquid diminishing with the external temperature, the cold, which is the consequence of this evaporation, must diminish in the same proportion; and if it were possible to prevent evaporation altogether, the author presumes that there would be no difference whatever between the temperature of a liquid and that of a surrounding medium.

2. The temperature of liquids, such as water and alcohol, as well as the rapidity with which they evaporate, varies, all other circumstances remaining the same, according to the nature of the vessel in which these liquids are contained. For instance, the temperature of the surrounding atmosphere being from 15° to

20°, water is, on the average, 0.3° warmer in an open metallic vessel than in a similar one of polished porcelain, and 0.2° warmer than in a similar one of glass. It is the same with alcohol. Again, both water and alcohol evaporate more rapidly from a porcelain vessel than from a metallic or glass vessel of precisely the same size. For example—three similar vessels, one of metal, the second of porcelain, and the third of glass, containing each 600 grains of water, having been exposed to evaporation during seven days, the temperature of the surrounding atmosphere varying from 20° to 25°, it was found, that at the end of that time, the porcelain vessel had lost 303 grains of its previous weight, the metallic one 277, and the glass vessel 275.5 grains only. The author enters into considerable detail as to the precautions he took to make sure that these differences could not be attributed to any difference in the radiating or conducting powers of the vessels employed.

The differences observed in the temperature of liquids, according to the nature of the vessels in which they are contained, depends, no doubt, on the property with which these vessels appear to be endowed, of accelerating or delaying evaporation. It is evident, that in each case the quantity of sensible heat subtracted from the liquid, or, in other words, the diminution of its temperature, must be in proportion to the quantity of vapor formed. For instance, the fact that water and alcohol are constantly colder in a porcelain vessel than in a similar vessel of metal or glass, is the natural result of the more rapid evaporation of these liquids from the former of these vessels than from the two latter. The reason why a porcelain vessel evaporates more freely than a metallic or glass one is far less evident. The author has proved, by placing a hermetically-closed bottle of porcelain, containing water, under the vacuum of the air pump, that it cannot be owing to any perviousness of the sides of the vessel, as he was at first inclined to suspect.

3. The influence of the mass or depth of a liquid was next examined. The author's experiments appear to lead to the curious fact, that the rapidity with which any given liquor evaporates depends not only on the extent of its surface, but also, within certain limits, on its depth. He found, for instance, that with two similar cylindrical porcelain vessels, containing, the first a

layer of water of one-twelfth of an inch in depth, and the second a layer of half an inch, the evaporation from the latter exceeded that of the former in the proportion of nearly 4 to 3. A similar result was obtained with alcohol. If thin glass vessels were used, the same increase of depth accelerated the evaporation in the proportion of 6 to 5. As the author himself observes, this apparent influence of the depth of a liquid on its evaporation, may, very possibly, be merely owing to the greater facility with which the different layers are conveyed, one after the other, to the surface, when the liquid is of a certain depth than when it is quite shallow.

4. Water containing a solution of salt in about the same proportion of sea water, evaporates less rapidly, and, consequently, produces less cold than the same quantity of distilled water. The higher the temperature of the surrounding atmosphere, the greater the difference between the quantities of salt and fresh water evaporated in a given time, under similar circumstances.

5. A given quantity of water, mixed with certain pulverulent substances, such as a siliceous sand, for the particles of which it has but a slight adhesion, evaporates more rapidly than the same quantity of distilled water *alone*. The fact was ascertained in the following manner:—The author, having procured two small porcelain vessels, exactly of the same size, introduced into one of them 300 grains of distilled water, and into the other a small quantity of siliceous sand, over which 300 grains of water were poured, so as not only to saturate the sand, but also to leave a layer of water of about one-tenth of an inch in thickness over and above its surface. At the end of five days, it was observed that the water standing alone had lost 184 grains of its previous weight, while the water mixed with the sand had lost no less than 196 grains. The average difference, resulting from a series of experiments, was $7\frac{1}{2}$ per cent. in favor of the more rapid evaporation of water mixed with sand compared with that of water standing alone. If the experiment be made with glass or metallic vessels, the difference is only about $4\frac{1}{2}$ per cent.

6. The last result we shall mention, and which may be regarded as a direct consequence of the preceding one, is the following:—Water mixed with sand remains habitually at a slightly lower temperature than an equal surface of water standing alone. The difference varies to a certain extent, according to the nature of

the vessels in which the experiment is performed, never, however, exceeding half a degree Centigrade. It is greater when the comparison is made between water and wet sand placed in two similar metallic vessels, than when they are placed in porcelain or glass vessels; in the latter case it seldom exceeds 0.1° to 0.2° .

The author concludes by remarking, that the foregoing result tends to confirm an opinion expressed some time since by Professor De la Rive, in a letter to M. Arago, published in the *Comptes Rendus de l'Académie des Sciences* for October, 1851. In this letter, M. De la Rive attributes the sudden appearance of vast glaciers in divers part of Europe to a temporary refrigeration produced at the period of the elevation of the most recent European strata, by the evaporation of the water with which they were previously covered. If, as the author's experiments tend to show, evaporation takes place more rapidly from water mixed with sand, earth, or any similar substance than from a surface of clear water, it becomes natural to conclude, that the cold produced by evaporation from the recently-elevated and still humid strata, must have been greater than that resulting from the evaporation of the sea or fresh water lake which covered them previously to a great depth.—*Bibliothèque Universelle, April, 1853., from Frank. Inst. Jour. and Repert. of Pat. Inv.*

THE ACCELERATION OF THE DRYING OF OILS BY METALLIC SALTS.

By BARRUEL AND JEAN.

According to the researches of Berthollet and Saussure, the drying oils do not absorb considerably, for a long time, oxygen from the air; but suddenly follows, after this inactivity, a rapid and almost violent reaction, which may be recognised by a considerable evolution of carbonic acid without a noticeable formation of water, and at the same time the oil dries with an increase of weight.

First of all, we found that an oil which contained no drying oil or any other drying agent, began after five or six days to evolve carbonic acid. In contrary instances, the evolution of carbonic acid commenced after eight or ten hours' contact with the air.

A very important fact which has arisen from our experiments is, that if the internal motion shall manifest itself in a distinct manner, a medium temperature from 50° to 59° Fahr. must exist, while under this degree of heat to 32° the action of the inciting or promoting body is always weaker. The necessity of a moderate temperature points out the analogy of this phenomenon to fermentation. We may remark here that the increase of weight of a layer on tin, after it was completely dry, amounted to 16 per cent. of the weight of the oil employed.

Farther, our experiments have shown that the direct or reflected light of the sun had a remarkable influence on the phenomena accompanying the drying of the oil. Thus, a surface of tin on which a film was painted, consisting of 69 grammes of oil boiled with black oxide of manganese and zinc-white, had taken up, after seven hours, in a dark place, only about 1.1 gramme; after twenty-four hours, the increase amounted to 2.23 grammes; while a similar surface exposed in a laboratory, at the same temperature, to the light of the bright sky, had taken up in seven hours about 3.33 grammes, and after twenty-four hours about 4.42 grammes. Under the direct influence of sunlight, the absorption is still more rapid than in the foregoing cases. In an experiment of twenty-four hours' duration, a similar surface covered with 35 grammes of zinc-white paint, with drying ingredients, had taken up about 4 grammes, and evolved .345 grammes of water, and 1 gramme of carbonic acid. The water obtained appeared to arise from the entire surface of the glass vessel employed for the experiment, and according to various weighings it was not proportional to the evolved carbonic acid. From the above, it seems that the absorption of the oxygen by drying oils, under the influence of light and heat, is the consequence of an internal impulse, which acts in the way of a ferment.

These, our new views, were established by a large number of facts, for we found bodies which, under the influence of light and a moderate temperature, in extremely small quantities, and in a very short time, effected the drying of the oil, or rather converted it into resin, by which carbonic acid was evolved and the oxygen of the air assimilated. There is, therefore, in our opinion, an oil fermentation analogous to the lactic acid fermentation.

In the manufacture of fatty drying oils, the oxides taken up by them are not completely reduced, by which, as we have convinced ourselves, carbonic acid is generated: the reduced oxide is thereby converted into a body, which acts on the oil like a ferment; the conclusion is, therefore, that boiled linseed oil has in no way drying properties when it contains no dissolved oxide. We found that the bodies which possess this inciting power in the greatest degree, are most protoxides of the metals Mn, Zn, Fe, Sn, Co, Cd, and among these the protoxides of cobalt and manganese afforded us the most satisfactory results. In some cases the protoxide of iron behaved in a similar manner, however less powerfully.

To find a ferment or siccative which acts rapidly without injury on the drying oils, we must consequently seek for compounds of the above-mentioned oxides, which are readily to be prepared on a large scale, and which allow these oxides to exercise their properties on the oil. This is not the case with the above-mentioned oxides when they are difficult to prepare, and cannot be preserved in contact with the air.

We directed our attention, therefore, in the first place to the inorganic and organic compounds of cobalt and manganese. We found that carbonic, phosphoric, sulphuric, nitric, and muriatic acids, as well as most organic acids, retained their oxides too firmly and almost destroyed their action. The salts of these acids in a basic condition have a distinct influence.

But of all inorganic acids, boracic acid is that which afforded the most satisfactory results in combination with the protoxide of cobalt and manganese. The proportion of borate of manganese, which suffices to induce fermentation in a drying oil, is from 1 to $1\frac{1}{2}$ thousandth part of the weight of the oil.

We may remark that the borate of manganese which we employ, and with the study of which we are now engaged, is not an anhydrous salt, but contains 25 per cent. of water. It seems to us to act in the following manner:—A portion of the protoxide is separated under the influence of light and heat, it absorbs the oxygen of the air to form the proto-peroxide, and then it is noticed that the oil begins to become adhesive. It is also remarkable, that the film at this moment acquires a color which disappears when the film is dry. If 1 to 2 per cent. of borate of

manganese is added to the oil, the brown coloration of the oil remains.

Two organic acids afforded us, with the protoxide of cobalt and manganese, salts analogous to that of the borate, namely, benzoic and hippuric acids. The resulting resins behave themselves as weak acids.

The rapid action of the borate of manganese, and the coloration which it communicates to the film, do not produce any bad results if, in its preparation, a certain quantity of some serviceable substance is mixed with the paint. This completely obviates this disadvantage, and renders the drying material not injurious. *Annals of Pharmacy*, from *Moniteur Industriel*.

EXAMINATION OF THE CRYSTALLINE DEPOSIT WHICH FORMS IN OIL OF BITTER ALMONDS.

By JOHN STENHOUSE, LL.D., F. R. S.

When oil of bitter almonds is kept for some time in loosely-stoppered bottles, a crystalline deposit not unfrequently forms in it, especially if the oil is exposed to the influence of the light. So long ago as 1823, M. Stange declared this crystalline deposit to be simply benzoic acid produced by the oxidation of the oil, a statement which was confirmed in 1830 by Robiquet and Boutron-Challard. (*Ann. de Chim. et de Phys.*, vol. xlv., p. 364.) It does not appear, however, that any of these chemists subjected the supposed benzoic acid to the test of analysis. Subsequently the late Dr. Jonathan Pereira, in the first edition of his *Elements of Materia Medica*, p. 1107, stated that he had met with "three kinds of a crystalline substance from oil of bitter almonds, differing essentially from each other and from benzoic acid." These deposits were examined by Dr. Pereira, and one of them, that marked No. 3, by Dr. Letheby. None of them were subjected to analysis, but they were tested by the action upon them of oil of vitriol, caustic potassa, &c. These crystalline deposits were given to Dr. Pereira by Mr. George Whipple, who kindly furnished me a few weeks ago with no fewer than ten different specimens of a similar character which had formed in as many portions of oil of bitter almonds. The weight of the crystals exceeded three ounces.

The crystals had a deep yellow color, and were strongly impregnated with oil of bitter almonds. As much of the oil as possible was removed by strongly compressing the crystals between folds of blotting-paper. The crystals were then digested with boiling water, in which they readily dissolved. After repeated solutions and crystallizations, they presented the usual characters of benzoic acid. On analysis, 0.4215 grm. substance dried at 212° F., when burnt in a current of oxygen gas, gave 1.069 carbonic acid and 0.2005 water =

	Calculated numbers.	Found numbers.
14 C. . .	68.853 . .	69.167
6 H. . .	4.915 . .	5.283
4 O. . .	26.232 . .	25.460
	<hr/> 100.000	<hr/> 100.000

The silver salt was prepared by neutralizing the acid with ammonia, and then adding a solution of nitrate of silver. When subjected to analysis, 0.3883 grm. salt gave 0.525 carbonic acid and 0.317 water.

1.1711 grm. salt gave 0.5516 silver.

	Calculated numbers.	Found numbers.
AgO. . .	50.654 . .	50.533
14 C. . .	36.684 . .	36.909
5 H. . .	2.183 . .	2.317
3 O. . .	10.479 . .	10.241
	<hr/> 100.000 -	<hr/> 100.000

From these results it is clear that the crystalline deposits from oil of bitter almonds examined by me were simply benzoic acid, and this I have reason to believe was also the case with two out of three samples described by Dr. Pereira; for through the kindness of Professor Redwood, I obtained three small specimens of these deposits from Dr. Pereira's collection, now in the possession of the Pharmaceutical Society. That marked No. 1, I found to be simply benzoic acid. I received also a specimen given to the Pharmaceutical Society by Mr. Whipple; it was also benzoic acid. The specimen marked No. 3, and which amounted only to a few grains in weight, was that examined by Drs. Pereira and Letheby. It consisted of small, acicular, lemon-yellow crystals,

which were insoluble in water, alcohol, ether, and acetic acid. Sulphuric acid reddened and then dissolved them, forming a deep yellow solution. They were not dissolved by a solution of caustic potassa in the cold; when heated with it, however, ammonia was evolved, which proved that the crystals contained nitrogen. When the crystals were strongly heated on platinum foil, they melted, and were decomposed, a small amount of sublimate only being produced.

The origin of the crystalline deposit No. 3 is very obscure. Mr. Whipple informs me that he only obtained it on one occasion, many years ago, when the essential oil of almonds was prepared by distillation over the naked fire; but ever since the operation has been effected by means of a steam apparatus, he has never met with it again, and has merely obtained deposits of benzoic acid. I strongly suspect that the yellow insoluble crystals, marked No. 3, were produced by the action of ammonia on oil of bitter almonds, and that the ammonia on that occasion was probably evolved by the charring of a portion of the nitrogenous pulp of the almonds by the over-heating of the bottom of the retort. The crystalline deposits which form in oil of bitter almonds must be regarded, therefore (unless in the single somewhat inexplicable instance just stated), as simply benzoic acid resulting from the oxidation of the oil.—*Lond. Pharm. Journal, March, 1854, from Philosophical Magazine.*

ANALYSIS OF CHURCH-HILL ALUM WATER, CITY OF RICHMOND,
VIRGINIA, AS MADE BY

PROF. JAMES C. BOOTH, OF PHILADELPHIA.*

The water forwarded for analysis, was received in Philadelphia in excellent condition. It is a brilliantly clear liquid, when freshly drawn,] possessing an astringent, styptic taste, rendered more agreeable by its large content of sulphuric acid, and with a marked after-taste of iron. The following are the results of an exact and minute analysis of a wine-gallon (58.372 grains) of the water, calculated also into 10,000 parts, for convenient comparison with the European waters of a similar character.

Specific gravity at 60° = 1.00694.

*[This paper should have been printed with the original matter.—EDITOR.]

Analysis.

	Grains in the gallon.	In 10,000 parts.
Potassa,	1.323	0.2267
Soda,	3.301	0.5655
Ammonia,	0.192	0.0328
Lime,	36.580	6.2668
Magnesia,	28.688	4.9147
Alumina,	21.870	3.7466
Protoxide of iron,	11.838	2.0280
Peroxide of iron,	62.186	10.6533
Sulphuric acid,	248.950	42.6488
Chlorine,	2.808	0.4810
Silica,	10.429	1.7867
Phosphoric acid,	trace	trace.
Total,	428.165	73.3509
Found by direct weight,	432.108	74.0267

The difference between the sum of the separate ingredients and the total amount of solid residue in the water is less than one per cent. The above ingredients are grouped together as salts, according to their respective affinities, in the following table, representing the rational analysis. The sulphuric acid belonging to the respective bases is placed opposite to them.

Rational Analysis.

	Grains in the gallon.	
	Salts.	Sulphuric Acid.
Sulphate of potassa,	2.444	1.121
Sulphate of soda	1.943	1.094
Chloride of sodium,	4.627	
Sulphate of ammonia,	0.643	0.451
Sulphate of lime,	88.836	52.257
Sulphate of magnesia,	86.064	57.376
Sulphate of alumina, (neutral,)	72.928	51.058
Protosulphate of iron,	24.991	13.153
Persulphate of iron, (neutral,)	51.270	30.762
Persulphate of iron, ($\frac{1}{2}$ basic,)	83.355	41.678
Silica,	10.429	
Phosphoric acid,	trace	
	427.530	248.950

<i>In 10,000 parts of the water.</i>		
	<i>Salts,</i>	<i>Sulphuric Acid.</i>
Sulphate of potassa, . . .	0.419	0.192
Sulphate of soda, . . .	0.333	0.188
Chloride of sodium, . . .	0.793	
Sulphate of ammonia, . . .	0.110	0.077
Sulphate of lime, . . .	15.219	8.952
Sulphate of magnesia, . . .	14.744	9.827
Sulphate of alumina, (neutral,) . . .	12.494	8.747
Protosulphate of iron, . . .	4.281	2.253
Persulphate of iron, (neutral, . . .	8.783	5.270
Persulphate of iron, ($\frac{1}{2}$ basic,) . . .	14.280	7.140
Silica, . . .	1.787	
Phosphoric acid, . . .	trace	
	<hr/> 73.243	<hr/> 42.648

The neutral sulphates of alumina and peroxide of iron have the formulæ $\text{Fe}_2\text{O}_3, 3\text{SO}_3$ and $\text{Al}_2\text{O}_3, 3\text{SO}_3$; and the basic salt has the formula $\text{Fe}_2\text{O}_3, 2\text{SO}_3$. The above salts may be thrown, for convenience, into the three following groups :

<i>Grains.</i>		
	<i>Per gallon.</i>	<i>Per gill.</i>
Total amount of alkaline salts, . . .	184 $\frac{1}{2}$	6
“ salts of iron, . . .	159 $\frac{1}{2}$	5
“ persulphate of alumina, . . .	73	2 $\frac{1}{2}$

Of the alkaline salts nearly one-half is Epsom salts, and nearly one half of the iron-salts consists of the oxides of iron.

We have carefully compared the analysis of this water with the analysis of a large number of the alum-waters of Europe, and find only four of them which will compare with it in richness of solid content, and none of them contain the ingredients of the several classes as well proportioned. We therefore regard it as one of the richest and best proportioned of all the alum-waters known. It is at the same time an alterative, astringent, tonic and laxative. The large proportion of iron salts renders it an excellent tonic. The aluminous salt tends to give it astringency, but this effect is modified by the laxative agency of the alkaline salts, especially of Epsom salt. The combination, as a whole, makes it an alterative. It will unquestionably be regarded as a useful adjuvant to the physician, and a valuable addition to the materia medica.

Varieties.

[NOTE.—For nearly a year past a series of articles have been published in the *Annals of Pharmacy* under the caption "Perfumery," by Mr. Septimus Piesse, extending over more than forty pages of that Journal. As some parts of them possess considerable interest, and many of the formulæ may be useful to our readers, it is proposed to publish those of them which are most likely to be acceptable, beginning in the present number with the second article of the series, the introductory chapter on generalities being omitted.—EDITOR AM. JOUR. PHARM.]

On Perfumery. By SEPTIMUS PIESSE.—The extensive flower farms in the neighborhood of Nice, Grasse, Montpellier, and Cannes, in France, at Adrianople (Turkey in Europe,) at Broussa and Uslak (Turkey in Asia,) and at Mitcham, in England, in a measure, indicates the commercial importance of that branch of chemistry called perfumery.

British India and Europe consume annually, at the very lowest estimate, 150,000 gallons! of perfumed spirits, under various titles, such as eau de Cologne, essence of lavender, esprit de rose, &c. The art of perfumery does not, however, confine itself to the production of scents for the handkerchief and bath, but extends to imparting odor to inodorous bodies, such as soap, oil, starch, and grease, which are consumed at the toilette of fashion. Some idea of the importance of this art to commerce may be formed when we state that one of the large perfumers of Grasse and Paris employ annually 80,000lbs. of orange flowers, 60,000lbs. of cassie flowers, 54,000lbs. of rose leaves, 32,000lbs. of jasmine blossoms, 32,000lbs. of violets, 20,000lbs. of tubereuse, 16,000lbs. of lilac, besides rosemary, mint, lemon, citron, thyme, and other odorous plants in like proportion. The quantity of odoriferous substances used in this way is far beyond the conception of those even used to abstract statistics, giving rise to an amount of industry truly gratifying.

The consumption of perfumery increases with the civilized state of society—it is strictly one of the arts of peace; it supplies one of our senses with a gratification; which, by use, becomes tutored to distinguish everything that is sweet to smell, and this art is certainly calculated to stamp the refinement of taste to one of our desires—the desire of pleasing the olfactory nerve.

To the chemical philosopher, the study of perfumery opens a book as yet unread; the practical perfumer, on his laboratory shelves, exhibits many rare essential oils, such as essential oil of the flower of the acacia farnesiana, essential oil of violets, tubereuse, jasmine, and others; the compositions of which have yet to be determined.

The exquisite pleasure derived from smelling at fragrant flowers, would

almost instinctively induce man to attempt to separate the odoriferous principle from them, so as to have the perfume when the season denies the flowers; and thus we find the alchemists of old torturing the plants in every way their invention could devise for this end. Their experiments were not wholly unsuccessful; indeed, upon their foundation the whole art of perfumery has been reared, which observation applies to numerous other useful manufactures. Without recapitulating those facts which may be found diffused through nearly all the old authors on medical botany, chemistry, pharmacy, and works of this character, from the time of Paracelsus to Celsus, we may state at once the mode of operation adopted by the practical perfumer of the present day for preparing the various extracts or essences, waters, oils, pomades, &c., used in his calling.

The processes are divided into four distinct operations; viz.—

1. *Expression*; 2. *Distillations*; 3. *Maceration*; 4. *Absorption*.

[The two first processes for volatile oils are so well described in the dispensaries, that they have been omitted here.]

3. *Maceration*.—Of all the processes for procuring the perfumes of flowers, this is the most important to the perfumer, and is the least understood in England; as this operation yields not only the most exquisite essences indirectly, but also nearly all those fine pomades known here as “French Pomatums,” so much admired for the strength of fragrance, together with “French oils” equally perfumed. The operation is conducted thus:—For what is called pomade, a certain quantity of purified mutton or deer suet is put into a clean metal or porcelain pan, this being melted by a steam heat; the kind of flowers required for the odor wanted are carefully picked and put into the liquid fat, and allowed to remain from twelve to forty-eight hours; the fat has a particular affinity or attraction for the oil of flowers, and thus, as it were, draws it out of them, and becomes itself, by their aid, highly perfumed; the fat is strained from the spent flowers, and fresh are added four or five times over, till the pomade is of the required strength; these various strengths of pomatums are noted by the French makers as Nos. 6, 12, 18, and 24, the higher numerals indicating the amount of fragrance in them. For perfumed oils the same operation is followed, but in lieu of suet, fine olive oil or oil of ben is used, and the same results are obtained. These oils are called “Huile Antiques” of such and such a flower.

When neither of the foregoing processes give satisfactory results, the method of procedure adopted is by,

4. *Absorption*, or *En Fleurage*.—The odors of some flowers are so delicate and volatile, that the heat required in the previously named processes would greatly modify, if not entirely spoil them; this process is, therefore, conducted cold, thus:—Square frames, about three inches deep, with a glass bottom, say two feet wide and three feet long, are procured; over the glass, a layer of fat is spread, about half an inch thick, with a kind of plaster knife or spatula; into this the flower buds are struck, cup downwards, and ranged completely over it, and there left from twelve to seventy-two hours.

Some houses, such as that of Messieurs Pilar and Sons, Pascal Brothers, H. Faye, and a few others, have three thousand such frames at work during the season; as they are filled, they are piled one over the other, the flowers are changed so long as the plants continue to bloom, now and then over a time of two or three months.

For oils of the same plants, coarse linen cloths are imbued with the finest olive oil or oil of ben, and stretched upon a frame made of iron; on these the flowers are laid and suffered to remain a few days. This operation is repeated several times, after which the cloths are subject to great pressure, to remove the now perfumed oil.

As we cannot give any general rule for working, without misleading the reader, we prefer explaining the process required for each when we come to speak of the individual flower or plant.

Whenever a still is named, or the article is said to be distilled or "drawn," it must be understood to be done so by steam apparatus, as this is the only mode which can be adopted for obtaining anything like a delicate odor; the old plan of having the fire immediately under the still, conveying an empyreumatic or burnt smell to the result, has become obsolete in every well-regulated perfumatory.

The steam-still differs from the one described only in the lower part, or pan, which is made double, so as to allow steam from a boiler to circulate around the pan for the purpose of boiling the contents, instead of a direct fire. In macerating, the heat is applied in the same way, or by a contrivance like the common glue-pot, as made use of now-a-days.

This description of apparatus will be found very useful for experiments which we will suggest by-and-bye.

The perfumes for the handkerchief, as found in the shops of Paris and London, are either simple or compound; the former are called *extraits*, *essprits*, or *essences*, and the latter *bouquets* and *nosegays*, which are mixtures of the extracts so compounded in quantity that no one flower or odor can be discovered as predominating over another; and when made of the delicate-scented flowers carefully blended, they produce an exquisite sensation on the olfactory nerve, which conveys to us the sense of smell, and are therefore, much prized by those whose wealth enables them to indulge in such pleasures.

We shall first explain the mode for obtaining the simple extracts of flowers, which will be followed by the process for preparing *ambergris* and *musk*, substances, which, though of animal origin, are of the utmost importance as forming a large part in the most approved bouquets, concluding this department of the art with recipes for all the fashionable bouquets and *nosegays*, the value of which, we doubt not, will be estimated according to the labor bestowed upon their analysis.

Expecting these remarks to become more a work of reference than anything else, we have adopted the alphabetical arrangement in preference to a more scientific classification.

We are not going to speak of, perhaps more than a tithe of the plants that have a perfume—only those will be mentioned that are used by the operative perfumer, and such as are imitated by him in consequence of there being a demand for the article; while, at the same time, from circumstances he is unable to sell the real. The first that comes under our notice is—

ALLSPICE.—The odoriferous principle of allspice, commonly called pimento, is obtained by distilling the dried fruit, before it is quite ripe, of the *Eugenia pimenta* and *Myrtus pimenta* with water. It is thus procured as an essential oil; it is but little used in perfumery, and when so, only in combination with other spice oils; for scenting soap it is, however, very agreeable, and much resembles the smell of cloves, and deserves more attention than it has hitherto received. Mixed in the proportion of two ounces of oil of allspice with one gallon of rectified spirit of wine, it forms what may be termed extract of allspice, which extract will be found very useful in the manufacture of low priced bouquets.

ALMONDS.—This perfume has been much esteemed for many ages. It may be procured by distilling the leaves of any of the laurel tribe, and the kernels of stone fruit; for trade purposes, it is obtained from the bitter almond, and exists in the skin or pellicle that covers the seed after it is shelled.* In the ordinary way, the almonds are put into the press for the purpose of obtaining the mild or fat oil from the nut; the cake which is left after this process is then mixed with salt and water, and allowed to remain together for about twenty-four hours, prior to distillation. The reason for moistening the cake is well understood to the practical chemist; and although we are not treating the subject of perfumery in a chemical sense, but only in a practical way, it may not be inappropriate here to observe, that the essential oil of almonds does not exist ready formed to any extent in the nut, but that it is produced by a species of fermentation, from the amygdalin and emulsine contained in the almonds, together with the water that is added. Analogous substances exist in laurel leaves, and hence the same course is to be pursued when they are distilled. Some manufacturers put the moistened cake into a bag of coarse cloth, or spread it upon a sieve, and then force the steam through it; in either case, the essential oil of the almond rises with the watery vapor, and is condensed in the still-worm. In this concentrated form, the odor of almonds is far from agreeable; but when diluted with spirit, in proportion of about one and a half ounce of the oil to a gallon of spirit or alcohol, it is very pleasant.

The essential oil of almonds enters into combination with soap, cold cream, and many other materials prepared by the perfumer; for which see their respective titles.

Fourteen pounds of the cake yields about one ounce of essential oil.

*This is an error; the perfume is generated from principles residing in the albumen of the almond, and not in its episperm as stated.—EDITOR AMER. JOURN. PHARM.

In experiments with this substance it must be carefully remembered that it is exceedingly *poisonous*, and, therefore, great caution is necessary in its admixture with substances used as a cosmetic, otherwise dangerous results may be brought about.

ANISE.—The odorous principle is procured by distilling the seeds of the plant *Pimpinella anisum*; the product is the oil of aniseed of commerce. As it congeals at a temperature of about 50 Fahr., it is frequently adulterated with a little spermaceti to give certain solidity to it, whereby the addition of other cheaper essential oils can be put to it with less chance of detection. As the oil of aniseed is quite soluble in spirit, and the spermaceti insoluble, the fraud is easily detected.

This perfume is exceedingly strong, and is, therefore, well adapted for mixing with soap and for scenting pomatums, but does not do nicely in compounds for handkerchief use.

BALSAM.—Under this article there are two or three substances used in perfumery, such as balsam of Peru, balsam of tolu, and balsam of storax (also called liquid amber.) The first named is procured from the *Myroxylon peruiferum*; it exudes from the tree when wounded, and is also obtained by boiling down the bark and branches in water. The latter is the most common method for procuring it. It has a strong odor like benzoin. Formerly it was much used for mixing with soap, but I think more with an idea of medicinal properties than for the sake of fragrance.

Balsam of tolu flows from the *Toluifera balsamum*. It resembles common resin (rosin); with the least warmth, however, it runs to a liquid, like brown treacle. The smell of it is particularly agreeable, and being soluble in alcohol makes a good basis for a bouquet, giving in this respect a permanence of odor to a perfume which the simple solution of an oil would not possess. For this purpose all these balsams are very useful, though not so much used as they might be.

Balsam of storax, commonly called gum styrax, is obtained in the same manner, and possessing similar properties, with a slight variation of odor, is applicable in the same manner as the above.

They are all imported from South America, Chili, and Mexico, where the trees that produce them are indigenous.

BALM, oil of Balm, called also, oil of Melissa, is obtained by distilling the leaves of the *Melissa officinalis* with water; it comes from the condensed steam or water, from which it is separated with the tap funnel. But very little used in perfumery, if we except its combination in *Aqua di Argento*.

BAY, oil of sweet Bay, also termed essential oil of laurel-berries, is a very fragrant substance, procured by distillation from the berries of the bay-laurel. Though very pleasant, it is not much used.

BERGAMOT.—This most useful perfume is procured from the *Citrus Bergamia*, by expression from the peel of the fruit. It has a soft sweet odor, too well known to need description here. When new and good it has a greenish yellow tint, but loses its greenness by age, especially if kept in

imperfectly corked bottles. It then becomes cloudy from the deposit of resinous matter, produced by the contact of the air, and acquires a turpentine smell.

It is best preserved in well stoppered bottles, kept in a cool cellar, and in the dark; light, especially the direct sunshine, quickly deteriorates its odor. This observation may be applied, indeed, to all perfumes, except rose, which is not so spoiled.

When bergamot is mixed with other essential oils it greatly adds to their richness, and gives a sweetness to spice oils, attainable by no other means, and such compounds are much used in the most highly-scented soaps. Mixed with rectified spirit in the proportions of about three ounces of bergamot to a gallon, it forms what is called "extract of bergamot," and in this state is used for the handkerchief. Though well covered with extract of orris and other matters, it is the leading ingredient in Bayley and Blew's Ess. Bouquet (see *Bouquets*).

BENZOIN, also called Benjamin.—This is a very useful substance to perfumers. It exudes from the *Styrax benzoin*, by wounding the tree, and drying, becomes a hard gum-resin. It is principally imported from Borneo, Java, Sumatra, and Siam. The best kind comes from the latter place, and used to be called *Amygdaloides*, because of its being interspersed with several white spots, which resemble broken almonds. When heated, these white specks rise as a smoke, and is easily condensed upon paper. The material thus separated from the benzoin is called flowers of benzoin in commerce, and by chemists is termed benzoic acid. It has all, or nearly all, the odor of the resin from which it is derived.

The extract, or tincture of benzoin, forms a good basis for a bouquet. Like balsam of tolu, it gives permanence and body to a perfume made with an essential oil in spirit.

The principal consumption of benzoin is in the manufacture of pastilles (see *Pastilles*), and for the preparation of fictitious vanilla pomade (see *Pomatus*).

CASCARILLA.—The bark is used in the formation of pastilles, also enters into the composition known as *Eau à Bruler*, for perfuming apartments, to which we refer.

CASSIE.—This is one of those fine odors which enters into the composition of the best handkerchief bouquets. When smelled at alone, it has an intense violet odor, and is rather sickly sweet.

It is procured by maceration from the *Acacia Farnesiana*. The purified fat is melted, into which the flowers are thrown and left to digest for several hours; the spent flowers are removed, and fresh are added, eight or ten times, until sufficient richness of perfume is obtained. As many flowers are used as the grease will cover, when they are put into it, in a liquid state.

After being strained, and the pomade has been kept at a heat sufficient only to retain its liquidity, all impurities will subside, by standing for a

few days. Finally cooled, it is the cassie pomade of commerce. The *Huile de Cassie*, or fat oil of cassie, is prepared in a similar manner, substituting the oil of Egyptian ben nut, olive oil, or almond oil, in place of suet. Both these preparations are obviously only a solution of the true essential oil of cassie flowers in the neutral fatty body. Europe may shortly be expecting to import a similar scented pomade from South Australia, derived from the wattle, a plant that belongs to the same genus as the *A. farnesiana*, and which grows most luxuriantly in Australia. Mutton fat being cheap, and the wattle plentiful, a profitable trade may be anticipated in curing the flowers, &c.

To prepare the extract of cassie, take six pounds of No. 24 (best quality) cassie pomade, and place upon it one gallon of the best rectified spirit, as sent out by Bowerbank, of Bishopsgate. After it has digested for three weeks or a month, at a summer heat, it is fit to draw from the pomatum, and, if good, has a beautiful green color, and rich flowery smell of the cassie blossom. All extracts made by this process—*maceration*, or as it may be called, cold *infusion*, give a more natural smell of the flowers to the result, than by merely dissolving the essential oil (procured by distillation) in the spirit; moreover, where the odor of the flower exists in only very minute quantities, as in the present instance, and with violet, jasmine, &c., it is the only practical mode of proceeding.

In this, and all other similar cases, the pomatum must be cut up into very small pieces, after the domestic manner of "chopping suet," prior to its being infused in the alcohol. The action of the mixture is simply a change of place in the odoriferous matter, which leaves the fat body by the superior attraction, or affinity, as the chemists say, of the spirits of wine, in which it freely dissolves.

The major part of the extract can be poured or drawn off the pomatum without trouble, but it still retains a portion in the interstices, which requires time to drain away, and this must be assisted by placing the pomatum in a large funnel, supported by a bottle, in order to collect the remainder. Finally, all the pomatum, which is now called *washed pomatum*, is to be put into a tin, which tin must be set into hot water, for the purpose of melting its contents; when the pomatum thus becomes liquefied, any extract that is still in it rises to the surface, and can be skimmed off.

The washed pomatum is preserved for use in the manufacture of dressing for the hair, for which purpose it is exceedingly well adapted, on account of the purity of the grease from which it was originally prepared, but more particularly on account of a certain portion of odor which it still retains, and were it not used up in this way, it would be advisable to put for a second infusion in spirit, and thus a weaker extract could be made serviceable for lower priced articles.

Not wishing to make unnecessary observations upon this, or any other substance treated of, for the mere purpose of writing, and thus to "make a

book," yet I cannot leave cassie without recommending it more especially to the notice of perfumers and druggists, as an article so well adapted for the purpose of the manufacture of essences for the handkerchief and pomades for the hair. When diluted with other odors, it imparts to the whole such a true flowery fragrance, that it is the admiration of all who smell it, and has not a little contributed to the great sale which certain proprietary articles have attained.

To those who are inexperienced, we caution them not to confound cassie with cassia, which has a totally different odor.

(To be continued.)

A Permanent Double Salt of the Protoxide of Iron.—The author states that the white carbonate of protoxide of iron, precipitated from a solution of protochloride of iron by carbonate of soda, dissolves, on the addition of diluted muriatic acid, to a colorless fluid, which remains unchanged exposed in open vessels to the air, does not become colored or turbid, and also leaves, on evaporation, an almost colorless double salt, which, exposed to the air, becomes moist, but undergoes no other change. As the dry double salt, on account of its hygroscopic properties, is less suitable for medical use than its solution, the author recommends the following form for the preparation of the solution for use;—

Liquor Ferri et Sodæ Nitrico chloridi:

In one ounce of muriatic acid, of specific gravity, 1.110 iron wire is added in excess and dissolved, so that a portion remains undissolved. To the pale green clear solution a saturated solution of carbonate of soda is added for the entire precipitation of the iron; afterwards, so much diluted nitric acid is added as will exactly dissolve the precipitate; and, lastly, the solution is diluted with distilled water, until the entire solution weighs 6 ounces. An ounce then contains 12.5 grammes of iron, which are proportionate to 40 grammes of protonitrate of iron, and 26 grammes of chloride of sodium.

This preparation is a colorless fluid, without odor; possesses a saline styptic taste; may be preserved for a long time without change; and leaves behind, on evaporation, nearly a white salt.—*Annals of Pharmacy*, March, 1854. [The word *grammes*, where it occurs in this paper, should read *grains*. As the Editors of the *Annals* give no authority, they are responsible for the error.—EDITOR AMER. JOUR. PHARM.]

The Application of Sulphate of Copper for the preservation of the Skins of Animals. By Dr. W. WICKE.—The doubtful efficacy of arsenious acid for the above object is known. Without mentioning that it poisons the air of chambers by slow decomposition, the true skin is destroyed by a peculiar arsenic emulsion, or the arsenic is only strongly taken up by the adhering flesh and fat, while the epidermis and the feathers are exposed to the unretarded destruction of the insect, which is chiefly to be feared.

Some time since, sulphate of iron was recommended instead of arsenious

acid, and employed in the same manner as that to be described for sulphate of copper. But soon the destructive influence of this agent was recognised, inasmuch as bright and particularly white feathers received a strong reddish incrustation from the separation of peroxide of iron. This is not the case with sulphate of copper. It will, in some instances, form crystals on the stems of the feathers, but these can be easily crushed and removed by means of pincers.

The sulphate of copper is employed in the form of a thick paste, made by rubbing the finely pulverized salt with water. The inner surface of the skin is spread over with the paste, and the remaining operations concluded as quickly as possible to prevent the water evaporating. If the paste is allowed to dry, the skin becomes inconveniently hard and brittle. The skin is thus thoroughly impregnated with the salt, which even penetrates into the stems of the feathers. It will now withstand decomposition, and the copper salt has a deadly action on insects. The keeper of the Oldenburg Museum has employed for several years this agent with the best results. He has found that it is advantageous to mix the sulphate of copper with about double its quantity of alum, which, by its property of forming insoluble compounds with organic tissues, may be very useful.—*Ibid*, from *Liebig's Annalen*.

Tincture of the Flowers of Colchicum.—Dr. Debout has recently called attention in the *Bulletin de Therapeutique* to the advantages of the flowers of colchicum over all other portions of the plant. He declares that the tincture of the flowers is less variable than that of the seeds or root, and far more efficacious. M. Luskind, a distinguished druggist of Geneva, gives the following directions for this preparation: The flowers are to be plucked before they have faded, on a fine sunshiny day. They should be placed in a silk bag and pressed. The juice is of a dark-brown color. It must be mingled immediately with an equal quantity of strong alcohol, and then set aside for a month. It is then filtered.

This preparation promises to be very uniform in its effects. M. Debout has administered it with success in many cases of obstinate rheumatic neuralgia and in paroxysms of gout.

This is not the first time that the efficacy of the flowers of colchicum has been promulgated. In 1823 Dr. Copland prescribed the flowers in substance, and found them less irritating, and more efficacious than the seeds. Frost and Bushell also employed them. According to the latter, they will cure chronic rheumatism. Bushell adds that they retard the movements of the heart.—*Virginia Med. and Surg. Journ.*

New Method of Testing Quinine. By Signor PAGLIARI.—Sig. Pagliari, a chemist of Rome, the inventor of a new hæmostatic compound, has published in the *Corrispondenza Scientifica* of Rome a procedure for deter-

mining the purity of the compounds of quinia with the greatest exactness; and, after repeated experiments, he has rendered the execution of his method extremely simple.

This method consists in heating a small quantity of the preparation of quinine in a spoon over burning charcoal. In a very short time the powder melts, leaving a residue of which we shall speak presently. The examination of this residue must be conducted with the greatest care, for its peculiar tint serves to characterize each compound.

Characteristics presented by perfectly pure sulphate of quinine: *residue of clear ruby color*; very pure quinine, *residue of the color of oil of sweet almonds*; citrate of quinine, *residue of clear citron color*, with excess of acid, *dark citron color*; valerianate of quinine, *residue of the color of the preparation itself*.

When either of these preparations is adulterated with foreign matter, the residue, after fusion, will be wanting in polish and transparency, and will present a blackish, porous appearance. If they are mixed with cinchonine or salicine, they become opaque; to be certain of the presence of salicine, concentrated sulphuric acid may be added, which will give rise to a red color.

These trials should be made with about a half a grain of the salts in question. The author hopes that these simple experiments will add one more obstacle to the falsifications of the salts of quinine.—*Ibid.*

Aconite as a Local Anodyne.—The comparative value of several of our local anaesthetics, was well exhibited in a case recently under the care of Mr. Curling, in the London Hospital. The patient, a woman of 47, had a patch of dry gangrene on the outer side of the left foot. Its slow increase was attended with such intense pain, that for several weeks she scarcely slept at all. To obtain relief, chloroform, on lint beneath oil-silk, belladonna lotion, and the solution of opium, were severally applied to the part, with, however, but very slight and temporary benefit. A liniment, consisting of equal parts of the soap liniment and of tincture of aconite, was then ordered to be used in the same manner; and so great was its efficiency, that under its influence the poor woman was frequently able to obtain a very fair night's rest. This case is only one among many in which we have seen proved the powers of aconite as a local remedy.—*Med. Times and Gaz.*, Nov. 11, 1853..

Composition of Oil of Thyme. By M. LALLEMAND.—This oil has been found by the author to contain a large quantity of stearoptene. He has given it the name of *Thymol*. It is crystalline, melts at 108° F., and will remain liquid for a considerable time at the ordinary temperature, a circumstance which may have been the reason why its presence in the oil has been hitherto overlooked. It has no rotary action on polarized light; in the crystalline state it behaves like other birefractive media. Its composition

is expressed by the formula $C_{20}H_{14}O_2$, differing from the camphor of *Laurenacæ* by two atoms of hydrogen.

Thymene, the other constituent of oil of thyme, is isomeric with terpenine (terbine). It does not exert any rotary motion on a ray of polarized light. Its composition is represented by the formula $C_{20}H_{16}$.—*Pharm. Jour.*, from *Comptes Rendus*, Sept., 1853.

A writer in the *Peninsular Medical Journal*, on secret remedies, publishes the following:

I do not know that you will consider the suggestion as worth your notice; but if you do, here is a formula to begin with, which I am informed is that of Ayer's Cherry Pectoral:

R.—Acetate of Morphia,	grains iv.
Tinct. Sanguinaria,	drachms ij.
Wine of Antimony,	“ iij.
Wine of Ipecac,	“ iij.
Syrup of Wild Cherry Bark,	ounces. iij.

N. Y. Med. Gaz.

Prize for the Cure of Cholera.—The Academy of Sciences of Paris, has received a legacy, 100,000 francs (\$20,000), left by a generous philanthropist, M. BREANT, as a recompense for him who shall discover a remedy for cholera. As this is not likely to be soon awarded, it is proposed to give the interest annually for the most useful discovery connected with cholera. During the first empire, a similar sum was left for the curer of croup, which has not yet been awarded. The new legacy will only serve to swell that large sum which the Academy annually distributes in the form of prizes.

Massachusetts College of Pharmacy.—The Massachusetts College of Pharmacy held its annual meeting in this city on the 5th inst., at the College in Phillips Place. Daniel Henchman presided. The attendance was large and the proceedings were of interest.

The following officers were elected for the ensuing year:—

Daniel Henchman, President. Samuel M. Colcord, First Vice President. Joseph T. Brown, Second Vice President. Joseph Burnett, Corresponding Secretary. Henry W. Lincoln, Recording Secretary. Ashel Boyden, Treasurer. Thomas Farrington, Auditor. Thomas Hollis, Samuel N. Brewer, Charles H. Atwood, Andrew Geyer, Atherton T. Brown, Thomas Restieaux, Samuel H. Woods, Henry D. Fowle, Trustees.

Many subjects of importance were discussed by the members. In consequence of an unusually large amount of business it was found necessary, at a late hour, to meet again three weeks from date.—*Boston Med. and Surg. Journal.*

Minutes of the College.

At a stated meeting of the Philadelphia College of Pharmacy, held Third Month March 27th, 1854. In the absence of the presiding officer Professor Bridges was called to the chair. The minutes of the last stated meeting were read and approved. The minutes of the Board of Trustees were then read by their Secretary. Since the last meeting of the College, they have elected William Taylor, Graduate in Pharmacy, a resident member. They also recommended to the College, E. H. Heinitch, of Columbia, S. C., as an associate member.

The minutes of the Board further informed that the Examining Committee and Professors had reported the names of 26 gentlemen, as having passed a satisfactory examination, and complied with the requirements of the College, and worthy the Degree of Graduate in Pharmacy. (See page 285.)

In accordance with the recommendation of the Committee and Professors, the Board proceeded to an election, and the Degree of Graduate in Pharmacy was unanimously conferred on each of them.

A written report was received from the Committee on Latin Labels, which was satisfactory, and the Committee was continued.

The Committee on a modification of the By-Laws regulating the admission of members was further continued.

On motion, the College proceeded to the election of E. H. Heinitch, as an Associate Member, as recommended by the Board of Trustees. E. T. Ellis was appointed Teller, upon whose report the Chairman declared him unanimously elected.

On motion of Edward Parrish, it was resolved that the Board of Trustees have authority to dispense with the present seal, now in use on the diplomas, and have a new one made for use on the diplomas and certificates of membership, in accordance with the suggestion of a Committee of the Board, as detailed in their minutes.

The Committee appointed to inquire into the reputed abuse of the name of the College, in connection with business advertisements, made a report absolving the member complained of, from any intentional impropriety of conduct. The report was satisfactory, and the Committee were discharged from further attention to the subject.

Considerable discussion ensued as to the propriety of using the certificate of membership, or the diploma of the College, as a passport to public favor through the medium of the press, and the following resolution being offered, was adopted.

Resolved, That it is the sense of this College, that the publication of the certificate of membership and the diploma, as a business advertisement, is anti-professional and inconsistent with the spirit of our code of ethics.

A communication from Thos. H. Montgomery, a member and graduate of this College, informing that he had withdrawn from the business on account of ill health, and desired to withdraw from membership, was read and accepted, and by a vote of the College he was allowed to retain his certificate of membership, at his own request,

The following report of the Publishing Committee, accompanied by a statement of its Treasurer, was read and accepted.

To the Philadelphia College of Pharmacy.

The Publishing Committee respectfully report, that since their last communication to the College, the *Journal* has issued regularly every other month at or before the appointed time. The change then announced as having been adopted, in regard to the increased size of the Volume, has now been tried for more than a year, and the subscribers having had an opportunity to consider the new arrangement have generally given it their approval.

The printing and paper required by the extra copies and the larger size of the *Journal* have caused a much larger demand on the Treasurer, and the Committee believe it inexpedient to withdraw any funds from his balance, for the sinking fund, except the \$50 usually appropriated.

The Report of the Treasurer, annexed here unto, will exhibit the state of the finances of the *Journal*, all of which is submitted by

CHARLES ELLIS,	} Committee.
W. PROCTER, JR.,	
R. BRIDGES,	
A. B. TAYLOR,	

The report of the Committee on the Sinking Fund was read and approved.

On motion, the Board proceeded to the annual election of officers for the ensuing year.

Wm. J. Jenks and Daniel S. Jones were appointed Tellers, and the College took a recess for a few minutes. The meeting being called to order, the Tellers reported that the following members had received a majority of votes for the respective offices, and they were accordingly declared duly elected.

<i>President</i>	Charles Ellis,
<i>1st Vice President</i>	Samuel F. Troth,
<i>2d Vice President</i>	Dillwyn Parrish,
<i>Treasurer</i>	Ambrose Smith,
<i>Recording Secretary</i> : . . .	Edward Parrish,
<i>Corresponding Sec.</i>	Joseph C. Turnpenny.

Trustees.

William Procter, Jr.,	Robert Bridges,
John H. Ecky,	Edward Parrish,
William P. Troth,	Daniel S. Jones,
Caleb H. Needles,	W. W. D. Livermore.

Publishing Committee.

Robert Bridges,	William Procter, Jr.,
Edward Parrish,	Charles Ellis,
Alfred B. Taylor.	

Committee on Sinking Fund.

Samuel F. Troth, Ambrose Smith, Edward Parrish.

Delegates to the American Pharmaceutical Association.

Henry C. Blair, John H. Ecky, Charles Ellis.

Charles Bullock, Charles H. Dingee,

And the Board adjourned.

DILLWYN PARRISH,
Secretary.

Philadelphia College of Pharmacy.**COMMENCEMENT—1854.**

The Annual Commencement of the Philadelphia College of Pharmacy was held on Tuesday evening, April 18th, at 8 o'clock, in the Musical Fund Hall, in the presence of a large and respectable audience.

The Degree of Graduate of Pharmacy was conferred, on behalf of the Board of Trustees, by its Presiding Officer, HENRY C. BLAIR, Esq., on the following gentlemen:

Graduating Class.		Subject of Thesis.
MAURICE W. ALEXANDER,	Pa. . . .	Melissa.
THOMAS H. BARE,	Ind. . . .	Magnesia.
MORTIMER H. BICKLEY,	Pa. . . .	Eupatorium Perfoliatum.
JAMES L. BISPHAM,	"	Potassæ Phosphas.
HENRY C. BOWER,	"	Ricinus Communis.
JOHN BROUGHTON,	Va. . . .	Preparation of the Salts of Nickel.
THOMAS M. CLARK,	N.J. . . .	Opium.
RICHARD S. COX,	N.Y. . . .	Juglans Cinerea.
ROBERT K. DILLARD,	Ala. . . .	Spigelia Marilandica.
CHARLES H. EGGERT,	Pa. . . .	Manganese and its Preparations.
LOUIS M. EMMANUEL,	"	Cassia.
EDWARD GAILLARD,	"	Arnica Montana.
SAMUEL GERHART,	"	Adulteration of Drugs.
EDWARD H. HANCE,	"	Chimaphila Umbellata.
LEVI H. HARRIS,	"	Chimaphila Umbellata.
DAVID S. JACOBY,	"	Achillea Millefolium.
JOSEPH LEMBERGER,	"	Gillenia Trifoliata.
DAVID LEWIS, Jr.,	"	Gillenia Trifoliata
GEORGE H. MARKLEY,	"	Quassia. <small>(as compared with Ipecacuanha)</small>
WILLIAM J. MILLER,	"	Pareira Brava.
JOHN H. PALETHORP, Jr.,	"	Rudbeckia Laciniata.
JAMES T. SHINN,	"	Gossypium Herbaceum.
DAVID L. STACKHOUSE,	"	Iris Versicolor.
HENRY C. STEEVER,	"	Radix Helonias Dioicæ.
WILLIAM H. THOMPSON,	"	Scoparius.
JOHN WYETH,	"	Gillenia Trifoliata.

After the ceremony, the Valedictory Address was delivered by Prof. ROBERT P. THOMAS.

By Order of Board of Trustees,

ALFRED B. TAYLOR, Secretary.

Editorial Department.

MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.—The time of the annual meeting of this body is rapidly approaching. There is no class of persons whose avocation requires more unremitting attention, than pharmacutists; and none to whom recreation is more acceptable. Many of the brethren in the Atlantic cities, have not yet visited the valley of the Ohio, and we would suggest to these, the idea of getting into the cars some pleasant morning about the 23d of July, and be wafted over the Alleghanies and down the Ohio, so as to reach Cincinnati on or before the 25th of that month, to attend the meeting of the Association, after which they can return by Niagara and the Hudson.

The hint is hardly necessary to our western friends; they are so accustomed to locomotion, that a few hundreds of miles is a small obstacle to them, if their interest is excited. Last year, Baltimore was without a representative at Boston. There has never been a member from the South, except from Richmond. The Association is national, its members should hail from every State. Charleston and Savannah, Mobile and New Orleans, Natchez, Nashville and St. Louis, have pharmacutists, whose countenance and talents would be useful to the Association, and on whom the influences of the Association would react beneficially. Then Chicago and Detroit, Cleveland, Pittsburg and Buffalo, Rochester and Albany, have equally honorable examples. Our New England brethren, who turned out so earnestly last year, will not be absent. Philadelphia has appointed delegates, and New York will doubtless be well represented. Under these circumstances, it is reasonable to anticipate a full meeting on the banks of the "*beautiful river*," in the Queen City of the West.

In glancing at the future prospects of the Association, we do not see the elements of sudden growth to power and influence. Originating in the most disinterested spirit, it has so far been carried on, without stooping from its high aims. These have had reference chiefly to the drug market, to the existing state of pharmacy, and to local organization.

The primary importance of increasing the facilities for pharmaceutical instruction, is beginning to attract the attention it deserves. Many young men perceive that there is something else required, besides the practical routine of the shop, to make a thorough pharmacist, and they are seeking

a higher education. These and all other points tending to improve the internal condition of the profession, should be urged forward and encouraged by the Association.

But there is another vocation, for which it seems peculiarly fitted, and which would add largely to its usefulness. We allude to the adoption of measures calculated to enlist the talented members of the profession, and to direct their efforts to some of the objects of investigation of the deepest interest to medicine and pharmacy. The noble results that have been called forth by the annual questions of the French Academy, are an example of what can be accomplished by this kind of encouragement. The annual meetings of the Association would become rich treats of intellectual pleasures, affording an ample return to the members for the sacrifices they make to get to them; its character as a body would acquire firmness and respectability; its published transactions would become valuable contributions to the literature of science, and a field would be opened and a tribunal be erected, where the honorable exertions of aspiring talent and industry would meet with a just appreciation.

BIOGRAPHY OF DR. DALTON.—Dr. John Dalton, the illustrious discoverer of the law of multiple proportions and author of the Atomic theory, died in 1844, and bequeathed his papers to Dr. William Charles Henry, as his literary executor. Dr. Henry has nearly completed a biography of Dr. Dalton, which will be published under the auspices of the Cavendish Society, than which no more appropriate publisher could have been chosen.

CASTILLON'S ELIXIR.—A correspondent having inquired for the formula for the above preparation, which has been prescribed to some extent in this city, the following has been given to us, as the recipe for making it.

R. Pulv: Cinchonæ Rubra,
 Pulv: Gentianæ,
 Pulv: Columbæ, aa 3j.
 Pulv: Ipecacuanhæ, 3ss.
 Pulv: Cinnamomi 3j.
 Capsulæ Papaveris. 3ij.
 Spiritus Vini Gallice, Oij.

Macerate the ingredients for twelve hours and displace, using diluted alcohol to remove the last portion of the tincture.

NICKEL'S PATENT ELASTIC PLASTER.—Since noticing these plasters in the January number, we have received from Mr. Henry Lowe, of Fayette and Park Sts., Baltimore, (who has obtained the Agency for the United States,) several samples of the plaster of different kinds and qualities. The tissue upon which the plaster is spread being woven and elastic, it admits of application over any inequalities of surface, as at the joints. The prices quoted are \$1.50 and \$1.75 per yard eight inches wide, according to the fineness of the tissue.

NEW YORK JOURNAL OF PHARMACY.—We were not aware, until after our last number had been printed, that the New York Journal of Pharmacy had been continued under new auspices, as an independent Journal. The editorship is in charge of Dr. Thomas Anticell, whose chemical predilections will prove useful to his readers. The names of Dr. Torrey, Dr. Enderlin and Mr. Canavan are attached as collaborators. The size has also been increased to 48 pages, and altogether the work presents an improved aspect. If the pharmacutists of New York city will make it the vehicle for communicating observations and discoveries, they would be doing service to the profession, and advance the character of the Journal.

CORRECTION.—In the formula of Mr. Wiegand, for Compound Syrup of Phosphate of Iron, in our last number, the phosphate of potassa was accidentally omitted in copying for the press. Our readers will please to turn to page 112, and add with a pen "Phosphate of Potassa, two drachms," after line 3d from the top.

ANALYSIS OF CHURCH HILL ALUM WATER.—The analysis of this mineral water as presented at page 269, was handed to us for publication by Dr. Joseph Klapp, of Philada, who copied it from the original draft, signed by Prof. Booth in his public capacity of analytical chemist.

As the publication of the formula in this Journal has no object but as a record of scientific investigation, Prof. Booth desires, in justice to Mr. T. H. Garrett, his laboratory assistant, that the analysis should be attributed to Mr. Garrett equally with himself.

THE GEORGIA BLISTER AND CRITIC, is the title of a Southern Medical Journal dating from Atalanta, March 1st, 1854, "devoted to the development of Southern Medical literature, and the exposition of the diseases and physical peculiarities of the Negro race." The tone of the Blister is independent, and the style racy, perhaps a little too spicy. The Editor Dr. H. A. Ramsey is an ultra Southern man, and speaks out what he thinks, perhaps a little too freely for the conventional proprieties of medical Journalism.

EDITORIAL CHANGES.—Doctors F. G. Smith and J. B. Biddle have retired from the editorial charge of the Medical Examiner, (of Philadelphia,) which Journal is now edited by Dr. Samuel L. Hollingsworth.

Dr. Joseph Parrish, editor of the New Jersey Medical Reporter, having removed to Philadelphia, has resigned the editorship of that Journal, but continues as associate editor, Dr. Butler, late associate editor, now assuming the editorial supervision.

The Richmond Stethoscope has been bought by, and is now the organ of the Virginia Medical Society, Dr. Gooch retiring from the editorial chair, and Dr. T. P. Atkinson assuming the editorship, assisted by a Committee.